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MOTOR AGE

MOTOR HIGHWAY TO YELLOWSTONE PARK

Silver Creek Gate in National Park Region

CHEYENNE, WYO., March 13—A most serious problem that has confronted the railroad companies and the stage lines of Wyoming for many years has been solved by the incorporation at Rock Springs, Wyo., a few days ago of the Wyoming Auto Transit Co., of that city, with a capital stock of $50,000, furnished by Chicago and Des Moines, Ia., capitalists, to operate a line of motor cars, both passenger and freight, from Rock Springs, Wyo., to the heart of Yellowstone park, a distance of 200 miles. With this announcement comes also that of the plan to extend the line still further eastward across the southern part of the state to connect with the line to be constructed by the Rock Springs company.

Back of the movement are motor enthusiasts all over the state of Wyoming, assisted by the Denver Automobile Club. These men are now soliciting the aid of several counties through which it is proposed to run the highway, and favorable action is expected to be taken by the southern tiers of counties, including Laramie, Albany, Carbon and Sweetwater on the south, and Uinta and Fremont on the north and west. The Denver Automobile Club, realizing the importance of the highway to its members, inasmuch as it provides a tour that is excelled in no part of the country, is lending its aid to the movement, and it is even talked of extending the highway to Denver.

The plan is to run the highway over the best and shortest route by going west from Laramie, Wyo., by the way of Centennial to Saratoga, and on down the Platte valley to Fort Steele and Rawlins. This, it is believed, will make not only the shortest, but the most picturesque route.

From Rawlins, Wyo., two routes are proposed. Lander is after the route with much enthusiasm, as, in fact, are every one of the larger-sized towns in that part of the state. The county commissioners of Carbon and Fremont counties have tentatively agreed to build the road in their respective counties, connecting at the county line with the Lander road. If it goes west to Lander, from that point the road would run west to Fayette, where the same course into the park would be taken that has been mapped out by the Rock Springs Auto Transit Co. Other interests

ROADWAY AND VIRGINIA CASCADES IN THE YELLOWSTONE PARK

are putting all their influence to bear to have the highway follow the railroad between Rawlins and Rock Springs, thence following the Transit company's route up the Green River valley. This would eliminate Lander, however, but, it is contended, would give the best and most practical route for transcontinental motoring trips.

Parent Scheme Outlined

The parent scheme, and the one that resulted in widespread interest being taken in the project, was for the highway to extend northwest from Rock Springs, through the Eden valley to New Fork, and on to Boulder, Fayette, Pine, Dale, Cora, Uinta and through the Green river and Gros Ventre canyons into the Jackson's Hole and up the Snake river to the park. Connecting trips also will be made to several new towns now building around the Eden valley and Fremont canal districts.

The route as mapped out is thought the wildest, most rugged and most picturesque part of the state, excellent fishing and hunting being obtainable along the greater part of the trip. Jackson's Hole, the mecca of thousands of sportsmen, where 35,000 wild elk roam, and which has heretofore been reached only by long and tedious trips over the mountains by team or stage, will this summer be reached by motor cars from Rock Springs in a single day's trip. The big touring cars will carry passengers up the picturesque Green river valley to New Fork lake, Fayette lake, Jackson's Hole and other beautiful bodies of water famous for their fine fishing facilities.

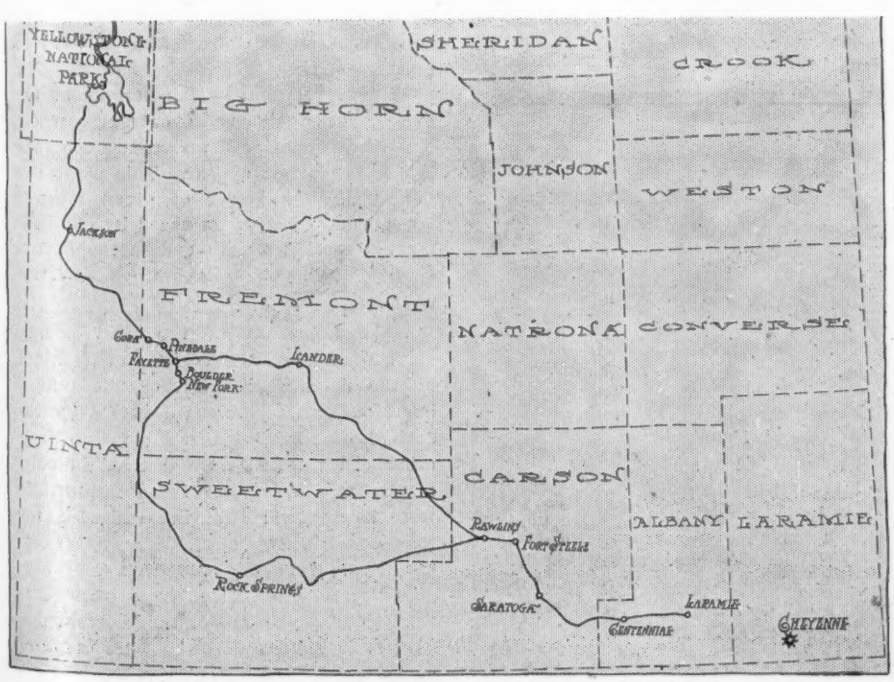
Seven cars already have been purchased for the use of the passenger service, each

ROADWAY TO YELLOWSTONE CANYON

THE GOLDEN GATE, NEAR MAMMOTH HOT SPRINGS, YELLOWSTONE NATIONAL PARK

carrying five persons. In addition to these, there will be cars specially constructed for carrying express and baggage, and others will transport heavy freight.

One hundred miles of good roads already have been constructed out to Rock Springs, and connecting with good roads that lead into the Jackson's Hole. Repair and machine shops are now being erected at Rock Springs by the Transit company, together with fine offices, waiting rooms and other buildings. Garages also will be constructed at different points along the highway.



MAP SHOWING PROPOSED MOTOR ROUTE TO YELLOWSTONE PARK

This motor highway has been discussed for several years by the Cheyenne Industrial Club, but nothing ever has come of it until lately. Now that the largest and most difficult part of the road has been mapped out and put in shape by the Wyoming Auto Transit Co., the promoters suggest that the residents of Cheyenne, Laramie and Rawlins use their best endeavors to construct good motor roads from Cheyenne to Rock Springs, connecting with their line at that point and thus affording a definite and direct motor highway through the state to the Yellowstone park.

So the question of carrying tourists into the Yellowstone national park through the grand scenic and game regions of Wyoming, a problem that has for years baffled both the railroad and stage companies, will be solved by the coming of the motor cars.

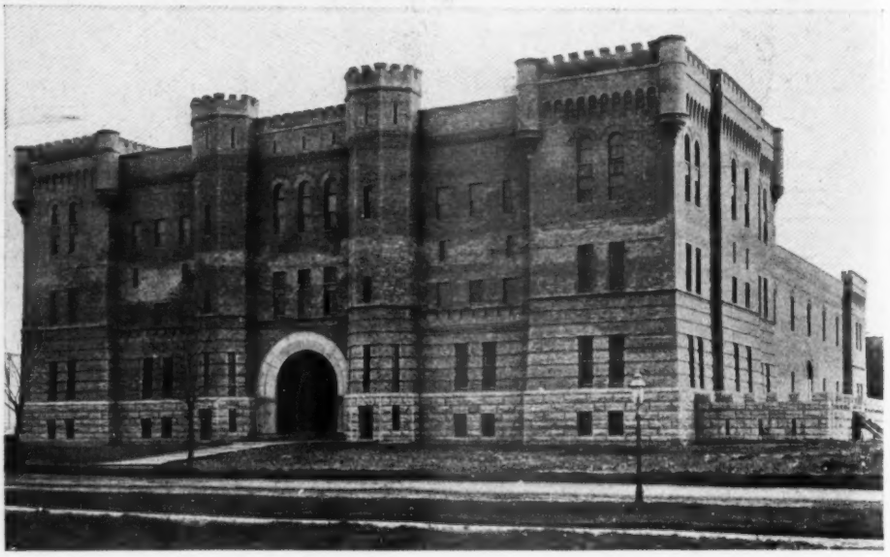
The incorporators of the Wyoming Auto Transit Co. are Fred C. Fisher, of Fayette, Wyo., president; J. W. Welch, of Des Moines, Ia., vice-president; J. E. Mershon, of Des Moines, secretary and treasurer; W. R. Mershon, auditor, Lloyd L. Bybee, of Knoxville, Ia., superintendent of roads.

NORTHWEST'S BIG SHOW AT MINNEAPOLIS

MINNEAPOLIS, MINN., March 15—Never in the history of motoring in the northwest has there been such an impetus given the trade as that produced by the opening of the Minneapolis show Saturday afternoon, in the state armory on Kenwood parkway. Public interest is keyed to a high pitch—every one in the Twin Cities, it seems, is talking show and thousands of people from Wisconsin, Minnesota, North and South Dakota and even from Montana are flocking into the cities for show week. The show will continue until Saturday night, and possibly it will be kept open Sunday to accommodate people who are unable to get into town during the week. Requests for this concession are already pouring in on the management and their decision will be announced later in the week.

As early as the first of last week all the big hotels reported a large advance reservation for rooms and it looks as if things all over town would be full to the brim during the week. All the prominent business houses, hotels, restaurants and clubs have responded nobly to help show week along. Special arrangements have been made for the entertainment of visitors, decorations in the show colors are prominently displayed, window cards and posters are seen on all sides and in every possible way the management has been given encouragement and assistance. In fact, it is a Minneapolis show in every sense of the word in that the prominent Minneapolis citizens are showing a keen interest in the success of the affair.

The show opened in a blinding snow storm at 2 o'clock Saturday afternoon, with a crashing salute on the parade grounds in front of the armory by Battery B, M. N. G. With the salutes still reverberating in the air, the First Field Artillery band struck up the "Star Spangled Banner," the doors were thrown open and fully 500 people who had gathered to see the doings were admitted. In spite of the continued snow the crowd increased all afternoon and in the evening the attendance surprised even the most sanguine of the exhibitors. Never before at any of the shows held in Minneapolis has the opening night drawn forth so many of the city's social set. The best people in the two cities were present—fully 300 machines were parked in front of the immense building and the box office figures gave the attendance as a little over 7,000 for the afternoon and evening. Conservative estimates place the total attendance for the week between 45,000 and 50,000.



MINNESOTA STATE ARMORY IN WHICH MINNEAPOLIS SHOW IS BEING HELD

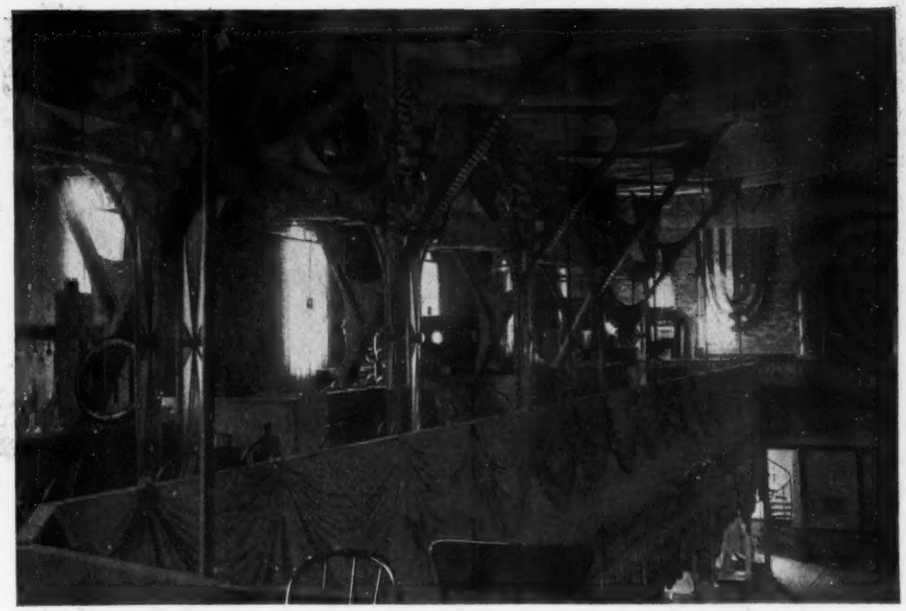
In the opinion of many who have attended all the principal shows of the year so far, the Minneapolis exhibition surpasses all the others in point of decorations and appointments. Expense has not been spared in securing ornate designs, not flashy or trashy, but giving one the impression of stability, beauty and grandeur. Primrose and purple are the colors used, while the plaster and stucco work forming the booths and exhibits give a fresh and thoroughly satisfying impression. Immense streamers alternating in the show colors drop from the dome of the immense main hall to the balcony. Each of these is fully 90 feet long and interwoven among these strips of color are strings of lights, 18 inches apart which make it bright as day in every part of the large main hall. There are also eighteen large basket cluster lights at the ends of the aisles and cross sections. The spacious balcony is devoted to the last inch to the accessory division, with the exception of the pergola at the end opposite the main entrance, where the band is stationed and where the soloists and quartets appear. This pergola is beautiful as a bower of green relieved by splashes of color produced by cut flowers and potted plants and is the beauty spot of all the elaborate decorative schemes.

When the doors of the show opened there were in all 108 vehicles of all kinds on the floors for exhibition. This number Monday was increased to 118 by the arrival of some of the show cars from other cities which were delayed in shipment. Of these cars the classifications were as follows: Touring cars, 35; toy tonneaux, 17; roadsters, 13; limousines, 5; chassis, 7; runabouts, 4; coupes, 4; buggies, 10; electrics, 3; package wagons, 1; trucks, 6; motor boats, 2; motor cycles, 11. It is figured that the total value of exhibits at the Minneapolis show is $1,200,000.

AT MINNEAPOLIS—SHOWING THE DECORATIONS

The importance of the Minneapolis show can be realized quickly by glancing at a map of the territory covered by the Minneapolis dealers. Fully half of the local dealers have a corps of agents located throughout Minnesota, North and South Dakota and some extend even into Montana. Northern Wisconsin is also handled largely through the Minneapolis dealers, and a large percentage of these agents are present at the show, besides many individuals who are looking the cars over before making a selection for their personal use during the coming season. Thousands of people throughout the territory made up their minds to wait for the Minneapolis show instead of taking in any of the other exhibitions and this represents a trading volume hard to measure up, but it is conservative to say that it runs up into the tens of thousands of dollars. Many of the dealers who are in a position to do so, report that they are closing up new agencies fast and the number of individual sales reported is large up to date. That the Minneapolis show is receiving the proper amount of attention at the hands of the leading lights in the motor industry is shown by the fact that many of the greater lights are present this week. Charles B. Shanks, of the Stearns company, was one of the first to arrive and E. Leroy Pelletier and Hayden Eames, of the Studebaker and E-M-F combination, and Frank Briscoe, of the Brush Runabout Co., followed soon afterwards. Many others are expected later.

Natty and well arranged exhibits throughout the building are one of the principal features of the show. The motor boat, truck and motor cycle division in the basement is just as elaborate in appointments as the cars on the main floor, while the accessory division, completely filling the big balconies, is a very popular place, drawing the attention of thousands. Many of the latest novelties in the way of equipment and ignition are shown and the business done in this section is large. In fact, on all sides the dealers report large sales. Innovations not only attract attention, but sales are made right and left after what might appear to be but a cursory examination of the new ideas set forth.

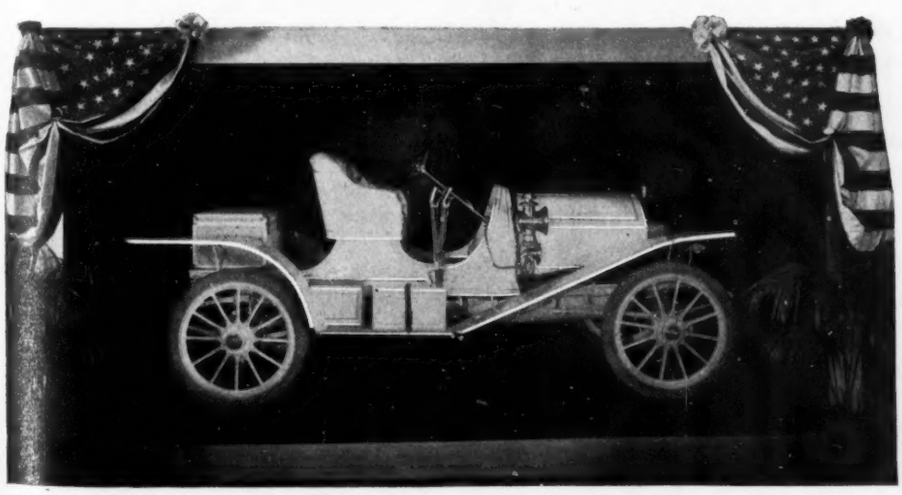


Acessory Division, Main Balcony, of the Minneapolis Show

With the opening of the show came the announcement that the name of the Wolfe cars and trucks, made by the H. E. Wilcox Motor Car Co., the only Minneapolis firm in the manufacturing end, to this extent, had been changed to the Wilcox car and trucks. The exhibit of Wilcox products is a beautiful one and it is winning generous praise. One racy roadster done in white and gold and with a nail-studded trunk in place of rumble seats, is mounted on blocks and is shown in a large cabinet lined entirely with black plush. The contrast is startling and most effective. In addition to this there are three other roadsters in deep purple, a dashing red and a black. The regular touring car is shown in black and yellow. The Wilcox line is noted for its clearance of 16 inches and is a chain-driven proposition. The Wilcox cars are all rated at 30 horsepower and include a Bosch high-tension magneto in the regular equipment. Wilcox trucks also are shown in the basement and the display includes several designs made to fill the requirements of several local firms. One is a 4-ton affair.

One feature of the Minneapolis show which caused considerable comment is the elaborate program of entertainment arranged for the week. A continuous vaudeville performance is put on in the ball room on the third floor, while soloists and quartets, together with the band, hold forth on the balcony overlooking the main hall. Smoking and rest rooms have also been provided, and in the latter attendants on duty care for the fair visitors who may be tired or indisposed. The ventilation of the huge building also is admirable. In fact, from every viewpoint the Minneapolis show of 1909 stands in a class by itself—a truly great success and a credit to the Minneapolis Automobile Show Association, which is composed of local dealers, and to the motoring public in general, which gave it such liberal support. The exhibitors:

Barclay Auto Co.—Chalmers-Detroit, Thomas.
Columbus Buggy Co.—Mora, Columbus electric, Firestone motor buggy.
Deere & Weber Co.—Velie.
East Side Auto Co.—Gyroscope, Oakland.
Fawkes Auto Co.—American, Reo, Overland, Rambler, Holsman.
Fox Motor Car Co.—Cartercar.
Haynes Auto Co.—Welch, Regal, Pennsylvania, Midland.
Joy Auto Co.—Packard, Pope-Hartford.
La Crosse Implement Co.—Jackson, Fuller.
Maxfield Auto Co.—Kisselkar.
Michigan Auto Co.—Knox.
Northwestern Auto Co.—Ford.
Pence Auto Co.—Stevens-Duryea, Buick.
H. E. Wilcox Motor Car Co.—Wilcox pleasure cars and trucks.
Victoria Motor Car Co.—Pullman, American Locomotive.
Westcott Carriage Co.—Bodies.
Kato Auto Co.—Kato trucks.
Kemp Brothers—Brush.
Motor Buggy Mfg. Co.—Minneapolis motor buggy.
Paegel-Allen Co.—Schacht.
Minneapolis Motor Cycle Co.—Minneapolis motor cycles.
Thiem Mfg. Co.—Thiem motor cycles.
Edwards Motor Cycle Co.—Wagner motor cycles.
Buchanan & Wiley—Excelsior motor cycles.



Wilcox Car as It Is Being Shown at Minneapolis

AT MILWAUKEE—LOOKING NORTHEAST ACROSS THE HIPPODROME FROM SOUTHWEST BALCONY

Black Mfg. Co.—Black motor buggy models.
Accessories—Barclay Auto Co., Beckley-Ralston Co., D. C. Bell Co., Combination Steam Vulcanizing Co., Electric Vulcanizer Co., Fawkes Auto Co., O. Fenstermacher, Garage Equipment Co., Hawley Demountable Rim Co., Hollis Electric Co., Hudson & Thurber, J. N. Johnson, Minneapolis Electric Co., Mulvery-Sartorius Co., National Gauge and Register Co., Northern Fire Apparatus Co., Northwestern Auto Co., Pence Auto Co., Pierson-Wilcox Co., Plant Rubber Co., Pure Oil Co., C. J. Smith, Stata Oil Tanks, Tokheim Mfg. Co., Universal Wind Shield, Zimmer Vacuum Renovating Co.

BOSTON UNPRECEDENTED SUCCESS

Boston, Mass., March 13—The Boston show closed its doors tonight after a week of unprecedented success. Everyone was amazed at the amount of business done and the factory men who came here intending to stay a few days were engulfed in the flood of enthusiasm and remained through the week. There were sales reported from every car represented, and it now looks, judging by the great number of orders booked here and elsewhere, that there will be a shortage of cars before the summer is over. The people swarmed into the building day after day by thousands and they found just what they were looking for apparently.

Low-priced cars were no more in demand than the higher-priced ones, comparatively speaking, when the prices are considered. Even the racing cars at the show were taken. The Lancia Lampo was sold to a Harvard man and several offers were made for the Vanderbilt Locomobile racer.

It is difficult to get a correct estimate of the number of cars sold during the show and so an average must be made. The lower this is placed the more conservative it will appear to the doubter. If each of the eighty-two makes represented sold one car a day that would make a total of 492 machines. Admitting that it may be too high, it is not too much to say that two-thirds of that number were sold, which would bring the figures in the neighborhood 325 machines. If the average of the cars was placed at $1,500 each the total figures would run close to $500,000.

That it will exceed that amount there is no doubt, but in this section of the country extravagant claims are never made. As showing how the figures are bound to run higher than given it may be stated that at one space the Motor Age representative saw sales made in 30 minutes that represented $23,000. The writer was impressed by the fact that during the week his opinion was asked by no fewer than twenty friends who were about to buy cars, relative to the merits of machines. Not one of these people owns a car at present, and three of them spoke of buying at least two. In price they ranged from the small runabout to the higher-priced machines. A year ago three people asked about cars, so this gives some idea of the great increase during the present season.

The commercial end also received a great impetus during the week. There were more vehicles displayed than formerly and the business man had a good chance to see what the firms were putting out. The gasoline and electric firms both reported a fine week's trade. The manager of one line showed the writer fifteen distinct orders for trucks, among them two for 5-ton ones. There is no doubt about other sales being good. Then there is the electric. It was surprising what a number of people evinced interest in these vehicles. This was particularly true of the women. They asked many questions about the mileage that showed they had been reading something about these machines and there were many of them booked for sale. The tire men did a great business, too, and the accessory men were delighted with the way sales were made.

When everything is figured out it is not too large an estimate to say that there were represented by the week's show more than $1,000,000 which changed hands, or will change within the next few months. There may be some that place the figures much higher, but it must be remembered that a million dollars is quite a lot when represented by just 1 week's work.

Manager Campbell, of the show, stated that the figures ran far ahead of any previous show, and he estimated the attendance at about 175,000. On the last 4 nights there were more people at the show than during the entire week of a year ago. And there were no kicks, for everything ran smoothly from start to finish. Now that it is all over, the men are putting in applications for space for next year. It is safe to say that when the 1910 show opens there will be at least an even 100 makes represented.

The work of entertaining the visitors at the Boston show who came from the factories devolved upon the entertainment committee of the Bay State A. A. The manner in which it did it was praised highly by everyone who partook of the hospitality. On Tuesday night there was a dance in Paul Revere hall which was

attended by about 500. On Friday night the club gave a smoker at its rooms at the Carleton and the place was filled. The program was a fine one and everyone had a great time. Manager C. I. Campbell, of the show, and F. P. O'Brien, of the Pierce-Arrow, chairman and secretary, respectively, of the committee, had charge of the affairs. At the conclusion of the show Manager Campbell was presented with a pair of field glasses by the newspaper men.

OMAHA HAS SHOW BODY

Omaha, Neb., March 12—At a well-attended meeting here Thursday afternoon of the Omaha Automobile Show Association a permanent organization was effected by the election of J. J. Deright as president, and Clarke Powell, secretary and treasurer; H. H. Van Brunt, Thomas Kimball, Dick Stewart, J. B. Davis and W. D. Hosford, as a committee on constitution and by-laws, and Messrs. Deright, Hosford and Powell as the executive committee to serve until the constitution is adopted, at which time it is expected that the regular election will be held, making these officers permanent for another year. It was also decided to hold the show another year.

MILWAUKEE A BUSINESS SHOW

Milwaukee, Wis., March 15—As a business proposition, the first annual Milwaukee motor show, which opened March 10 and closed Saturday at midnight, is characterized as a great success. From the standpoint of the Milwaukee Automobile Club, it was a great financial success, for it is conservatively estimated that no fewer than 25,000 people saw the show during the 4 days. From the standpoint of the exhibitor, the show was also a great success. While the dealers are somewhat overenthusiastic in making estimates of amount of business done in saying that it totaled $175,000, it is believed that no less than $125,000 worth of cars were sold. Added to this is the publicity feature, which is expected to result in hundreds of sales during the season. Many visitors had not intended to purchase, but went away with the conviction that they must have a car, and the dealers have a huge list of prospects that look good. The show resulted in the establishment of several new agencies in Milwaukee and around the state. Among the cars at the show that were shown for the first time in Milwaukee on this occasion were the Lozier, by Willard V. B. Campbell, of Horicon, Wis., state agent, and the Apperson, by American Automobile Co., Milwaukee, state agent.

The Mitchell, Rambler, Kissel and Johnson, all Wisconsin-made cars, carried off the honors in the matter of sales. Of this strong quartet, the Mitchell claims thirty-one sales of the popular-priced cars. The Rambler Garage Co., of Milwaukee, and the Kisselkar Co. report sales of twenty to thirty of the moderately-priced cars. The Johnson Service Co. sold few cars, but values the advertising above the sales. This line had its first real introduction to the Wisconsin public at the show. The Gove Automobile Co. sold twenty-five Jacksons and Regals. The Hickman-Lauson-Diener Co. sold thirteen small Fords and a number of other models. The Cartercar sales were small, but the company secured many prospects. Five Chalmers-Detroits and one Thomas Flyer were sold by the W. L. Hibbard Motor Car Co. In addition, several Chalmers-Detroits were sold to a new branch agent, Abel Brothers, Fond du Lac, Wis. Actual sales are estimated to have been 100.

The Akin Motor Car Co. had a branch exhibit at the Plankinton house; the Rambler company exhibited five big cars in the same building as auxiliary to the Hippodrome displays. Besides this, the Rambler had a small show in its big garage on Broadway. The Welch Brothers Motor Car Co. supplemented its Hippodrome display by an exhibit in its garage on Seventh street and Grand avenue.

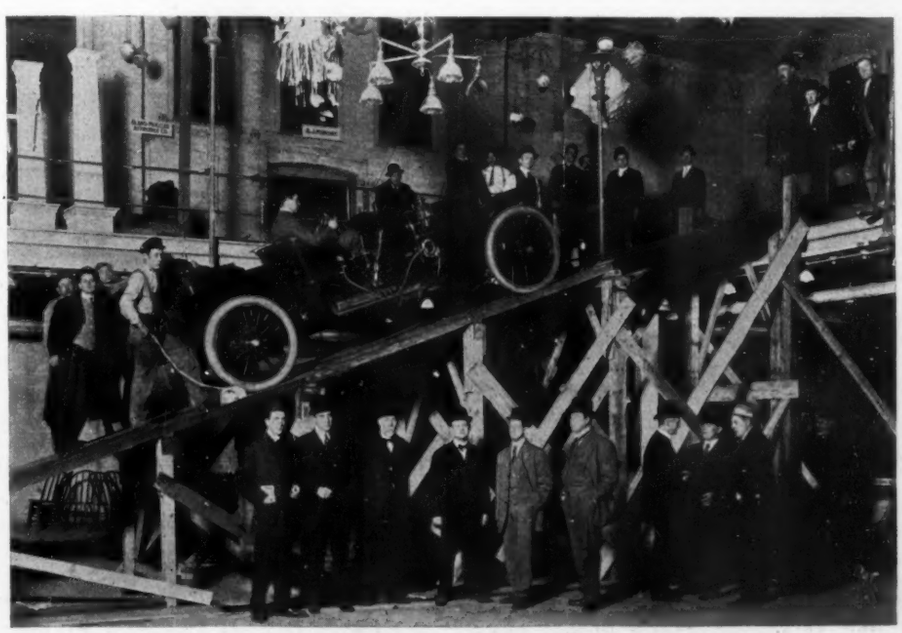
The Stoddard-Dayton exhibit in the Hippodrome was one of the largest and most comprehensive. A polished chassis attracted no end of attention. A new 15-30 Stearns was a latecomer. On Friday of show week the Kopmeier Brothers company placed a green American traveler in its exhibit of Americans and Detroit electrics. The Jonas company exhibited the chassis of a Cadillac that has run 7,000 miles. Among other chassis exhibits were: Reo, Winton, Rauch & Lang electric; Rambler, Johnson, Kissel, Chalmers-Detroit, Packard.

The Milwaukee Automobile Club is already planning for the next show, which will not be held before the spring of 1910, although there is some talk of holding a fall show. For the next show, the club will have the use of the $500,000 Auditorium, now being completed. The overflow will be accommodated in the Hippodrome, which was used this time but found altogether inadequate. The buildings are only one and a half blocks apart. The club promoted the show alone and will net a neat sum. Milwaukee proclaimed its willingness to pay double admission to get a distinct evening for itself. This alone shows that the show was patronized by all classes.

One of the pleasant features of the show was the attendance of a delegation of legislators, who passed up an important session to be here. On Thursday evening thirty members of the legislature were guests of Secretary James T. Drought at a dinner in the Plankinton house, and they assured the club officials of fairness in all matters that come before them. It was an enthusiastic gathering, and at the close Secretary Drought was elected "speaker of the third house."

PORTLAND SHOW A GOOD ONE

Portland, Ore., March 10 — Monday marked the opening of Portland's first show, which is being held in the O. N. G. armory, and if future events of this character are given in the same manner as this first exhibition there will be no doubt of their success. The armory is particularly well adapted for a show of this kind and when the dealers first decided on holding their show there it looked like room to spare, but when the 102 machines had been distributed the entire main floor was comfortably filled and the accessories department had to be content with the annex. Practically all the leading American manufacturers are represented by the latest and best products. The armory is transformed by the wizard art of many decorators, around the gallery being strung a high canvas upon which has been painted a panorama of pastoral scenes in which the motoring idea was strongly brought out. Here and there along the roads depicted are motor cars approaching



AT MILWAUKEE—PLACING A CAR IN BALCONY SPACE

AT PORTLAND—CORNER IN WHICH THE WHITE IS SHOWN

each other, and the entire scene is one which does credit to the artist and the taste of the promoters in suggesting such a decorative and beautiful effect. The lesser decorations of the hall are placed with judicious care and add greatly to the effect of the whole. An abundance of palms occupies the central space and about the upper arches, while just below the striking Grubach scenery is woven a frieze like tapestry of living green, set off at intervals with blooming plants standing on the squares which rise at regular intervals. All this blends softly with the colors in the scene painting, and is particularly attractive under the sheen of the electric lights. From the roof and girders of the building are swung innumerable Chinese lanterns and gaily-colored Japanese umbrellas, which are extremely effective, especially at night. Following is a list of the car exhibitors:

Studebaker Brothers' Automobile Co., Studebaker.
H. L. Keats Auto Co., Packard, Buick, Chalmers-Detroit, Thomas, Pope-Hartford.
Crowe Automobile Co., Stearns.
Fred A. Bennett Auto Co., Stoddard-Dayton, Mitchell.
E. E. Cohen, Maxwell.
Graham Motor Car Co., Stevens-Duryea, Selden.
H. M. Covey, Pierce, Cadillac.
J. B. Kelly, White.
Emmet Harris, Winton.
Auto Vehicle Co., Tourist.
Ford Motor Co., Ford.
Portland Motor Car Co., Peerless.
Idanha Motor Co., American, Auburn.
Crowe Automobile Co., Marmon, Overland, Stearns.

Dealers' Show Is Held at Rochester

ROCHESTER, N. Y., March 15—The motor car business and trade in western New York received a new impetus tonight when the second annual show of the Rochester Automobile Dealers' Association was inaugurated in Convention hall, this city. The exhibition will continue until Saturday night and is expected to result in stimulating interest in motoring in this section and vicinity to an extent that will justify the lavish expenditure of money made for decorations and in providing daily musical programs for the entertainment of spectators. Mayor Edgerton opened the exhibition, following a parade in which hundreds of cars, owners and exhibitors participated. The exhibition is the largest in the history of the local association. The decorations of the large Convention hall are a distinct advance of anything ever before attempted in western New York. The opening tonight was attended by crowds of people.

Green and white is the color scheme of the decorations. High above the proscenium is a painting of gorgeous tints, while on either side are wheels of blue and gold. For the ceiling a large stretch of deep blue canvas, resembling a sky, has been painted. In the center is a large ball of gold from which hundreds of electric lights flash. Streamers of bunting and long lines of electric lights are suspended from the ceiling and balcony railings. Twenty-two hundred bulbs are used in these decorations.

Eighty cars are shown by the various exhibitors on the ground floor of the hall. The accessories exhibitors occupy the gallery space. The show is exclusively a dealers' exhibition, no motor car manufacturers exhibiting direct.

The exhibit contains but one car that has not been exhibited before. This is an ambulance car just completed by James Cunningham, Son & Co., designed and manufactured by the company at its Rochester plant and the first motor ambulance exhibited in Rochester. It has a 30-horsepower four-cylinder Continental motor. The interior of the ambulance contains up-to-date equipment. The cot is suspended from spiral springs and there are drop seats on the side for surgeons, medicine chest, thermometer and lanterns; drop windows furnish ventilation. The ambulance is one of the features of the exhibit. The same company is also showing a limousine.

Five shipments of exhibits were made by express from the Boston show which closed Saturday night. The Winton, Buick, White, Rambler and Kisselkars shown here were exhibited at the Boston show.

Arthur McNall shows two models of the Peerless, four and six-cylinder cars; the Pope-Hartford, and seventeen models of the Rauch & Lang electrics. L. B. Kirkpatrick exhibits the Oakland Forty. The Caledonia Avenue Automobile Co. shows the Detroit electrics. Benton & Hughes offer the White and Rambler. The Strickland garage has the Atlas. The Selden car, a Rochester product, is handled by William C. Barry, Jr. C. L. Whiting has an exhibit of Buicks. Thomas J. Northway makes a feature of the Ford and the Reo. The Rochester Automobile Co., of which J. J. Mandery is the head, has a display of Packards, the Baker and the Lansden. The Babcock electric is shown by the Babcock Electric Garage and Sales Co. The 1909 Overland is exhibited by the Hollis-Rand Co. A. M. Zimbrich is featuring the Kisselkar and the Stoddard-Dayton. Marsh Walzer is showing the Brush runabout. D. M. Dorman has a display of Wintons. C. E. Hartson is showing the Mora. A. V. Hart has an exhibit of the Thomas, Chalmers-Detroit and Columbus electric. The Genesee Motor Vehicle Co. has the Maxwell on view. The Union Motor Co. has an exhibit of the Mitchell and the Chase motor wagon. The Mabbett-Bettys Motor Car Co. offers the Cadillac and the Stevens-Duryea. The Welch is shown by the Smith Sash and Door Co.

The accessory and supply dealers are well represented. The United States Automobile Co. shows a complete line of all descriptions. The Rochester Drop Forge Co., a new industry in the motor car accessory trade, has an exhibit of its manufactures. Clum & Atkinson offer for consideration their aluminum castings. The Holden company calls attention to its vulcanizing business. Robert Patterson shows his specialties in sheet metal work for cars and carrying fenders, hoods and radiators. The A. Faber Co. features its work of motor car repairing and special windshield equipment. The Rochester Railway and Light Co. presents the Mercury arc rectifier outfit, a novel method of charging batteries where series is employed. It is specially fitted for private garages.

Officers and directors of the Rochester Automobile Dealers' Association are: President, William C. Barry, Jr.; vice-pres-

ident, George J. Bauer; treasurer, Thomas J. Northway. Executive committee: William C. Barry, Jr., A. M. Zimbrich, George J. Bauer and Thomas J. Northway. The roster of the organization includes: C. L. Whiting, C. E. Hartseon, L. B. Kirkpatrick, Harry Woodworth, Arthur McNall, James C. Dryer, Union Motor Car Co., Benson & Hughes, Mabbett-Bettys Motor Car Co., Sager & Elliott and Hollis & Rand. List of exhibitors:

Hollis-Rand Co., Overland.
D. M. Dorman, Winton.
Babcock Electric Garage and Sales Co., Babcock.
C. E. Hartson, Mora.
C. L. Whiting, Buick.
A. V. Hart, Thomas, Chalmers-Detroit, Columbus electric.
Arthur McNall, Peerless, Pope-Hartford, Rauch & Lang.
L. B. Kirkpatrick, Oakland.
Genesee Motor Vehicle Co., Maxwell.
Benson & Hughes Motor Vehicle Co., White, Rambler.
Rochester Automobile Co., Packard, Baker, Lansden.
A. M. Zimbrich, Kisselkar, Stoddard-Dayton.
Thomas J. Northway, Ford, Reo.
Union Motor Co., Mitchell, Chase.
Selden Sales Agency, Selden.
Mabbett-Bettys Motor Car Co., Cadillac, Stevens-Duryea.
Caledonia Avenue Automobile Co., Detroit.
F. A. Brownell Motor Co.
Smith Sash and Door Co., Welch.
James C. Dryer.
United States Automobile Co
Rochester Rubber Co.
Scranton-Wetmore & Co.
J. C. Lighthouse.
A. Faber Co.
Gilbert Amsden.
Superior Belting Co.
Daggs Mfg. Co.
Jaynes Auto Supply Co.
Worcester Pressed Steel Co.
Holden Vulcanizing Works.
Wheeler-Green Electric Co.
S. B. Roby Co.
Rudolph-Schmidt & Co.
Kellogg Mfg. Co.
Elbridge Engine Co.
Long & Mann Co.
Sterling Oil Co.
Rochester Timer Co.
Bi-Cal-Ky Auxiliary Co.

NO SHOW IN WASHINGTON

Washington, D. C., March 13—It has been definitely decided that this city will not have a motor car show this year. Some weeks ago a movement was started to have a show early in April and while several dealers strongly advocated a show the greater number frowned on the idea. When it came to a showdown the anti-show people held the whip hand, with the result that the show negotiations were called off. While motor car shows seem to be a big success in other cities, they do not set the motor world afire in this city, and the more prominent trade people decided that the national capital would be better off this year without one of these functions.

NAMES 45 PER CENT TARIFF

Washington, D. C., March 17—Special telegram—Section 140 of the new tariff bill introduced today in congress provides "Motor cars and parts thereof, motor cycles and parts thereof, 45 per cent ad valorem." This is the same rate as at present levied, the only difference being that motor cars are specifically enumerated instead of being grouped as manufactures of iron and steel. It is expected that efforts will be made to have the senate increase the proposed duty as desired by American motor car manufacturers.

COAST RACE DATE SET

Southern California Motorists Choose National Holiday for Its Road Carnival

Los Angeles, Cal., March 12—Southern California is to have its road race July 4. For months there has been talk of an event of this kind, but nothing definite was done until a week ago, when the Automobile Dealers' Association of Southern California met and appointed a committee to investigate the matter thoroughly, decide on the most desirable course and formulate rules to govern such an event. This committee is composed of Leon T. Shettler, Ralph Hamlin and William R. Ruess, who are now at work investigating every desirable course near the city and who will have a report ready for the next meeting of the association. On the same day of the race here there will be a similar contest in Portland. There will in all probability be two races, an event for the light cars and one for the larger machines. Whether or not these will be held on the same day has not been decided. At the present time only two courses are under consideration, a San Fernando course and one of 8 miles along the Palisades and near the Soldiers' Home, on the outskirts of Santa Monica. There are several points in favor of each course. The longest stretches on the Santa Monica course would be a fraction over 3 miles in length. There would be a couple of turns, one being almost a hairpin. From the standpoint of the public the Santa Monica course is ideal. The electric line runs along the course for several miles and within a few hours 50,000 people could be carried to the course. A good view of the race could be had from any point and with the course only 8 miles around cars would be continually passing the spectators. If this course is adopted it will be necessary to run the races early in the morning to escape the strong wind which blows in off the ocean. The San Fernando course would be a harder test on drivers and cars. The big race will be about 250 miles in length, which would bring the cars around about twenty-three times. The small car race will probably be 150 miles long. In selecting a course in the San Fernando valley several roads offer themselves. The course could be made 11 miles around, or twice that far. The short course begins on the outskirts of Toluca. Already assurances of support have been received and it is expected there will be little difficulty experienced in getting entries enough to make the race a big success.

RAINIER REORGANIZES

New York, March 15—On March 8 there was registered at Albany a new corporation called the Rainier Motor Co., with a capital stock of $350,000, being the reorganized concern which has taken over the business of the old Rainier Motor Car Co., having acquired all rights, title and interest from the receiver. The management is practically in the same hands as before, John T. Rainier being president and Paul N. Lineberger vice-president. The headquarters of the new company will be at the corner of Broadway and Sixty-fourth street, New York city, where in addition to the corner store it will have the top floor, with over 22,000 square feet, which gives ample room for all departments, including repair and paint shops. The factory at Saginaw has resumed operations, and the new Rainier models will arrive in New York during the coming week.

AT MILWAUKEE—LOOKING ACROSS THE HIPPODROME

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MOTOR AGE

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Simplicity and Accessibility Necessary Factors

EVERY action or attainment admits of being outdone; the accomplishments of a leader of to-day may be represented by a circle one inch in diameter; around this circle innumerable other circles of larger diameter may be described with the same center, each representative of the possibility of accomplishments of others whose day is yet to be. The life of every man is but an apprenticeship to his ideal, which ideal is only valuable in proportion to the truth it contains. The motor car engineer who exclaims "I have designed the perfect car, I have accomplished perfection, I can now rest" will soon discover he is but a one-inch circle, that around his circle others of larger radius have already been described and that so much greater in diameter is the largest circle than his that his eye can scarcely follow the complete circle, much less comprehend all that is contained within its constantly curving outline.

THE accomplishments of some designers and builders never could be represented by a circle, no matter how small its diameter; their attainments can only be designated by a point. Euclid defines a point as that which has position but no magnitude. The designer or builder whose status is represented by a point is in ninety-seven cases out of every ninety-eight one who had a conception of certain car constructions before he entered the motor field; since he entered the field he has seen nothing else but that design; he has tried to make every other part of the car subservient to his one conception; whether prospering or failing his vision is bounded solely by that one ideal; if he remains in the industry until sheer failure ejects him he will see nothing else, for he cannot—his eyes are holden so that he can see no further, his ears are deadened so that he can hear no more. The motor industry has had several of these points; there are fewer this year than last and much fewer than three years ago. Many of them withstood a season or two, some had sufficient energy to withstand the strain of four seasons, but in the end stranded, and are but now wayside wrecks, mere memories, not forces in the great development of the motor industry.

THE status of a designer can be only measured by his works; the car—its ability, its reliability and its endurance—is the great scale on which the public measures the stature of the maker. The car itself is the circle which marks the confines of the ability of the designer and builder—the perfect car would be the circle, which typifies simplicity, art, greatest capacity for length of boundary, hardest to make yet containing fewest parts. The perfect car which would represent the circle has not yet arrived; many cars are ellipses, some are ovals and some sufficiently removed from perfection to be represented by rectangles, squares or hexagons.

SIMPLICITY is the leading characteristic of a circle and so must be of the car which is being pushed to that desired goal. Simplicity in a car may mean few parts. One car engineer who has been given the task of bringing order out of chaos in an American factory has in one part of the car used one piece where eighteen formerly were employed. The eighteen parts were needed in conjunction with releasing the clutch, some of them were nuts, some lock nuts, others washers, others bushings, some forgings and others cotter pins; but there were eighteen of them—eighteen chances of parts loosening.

THIS eighteen-to-one simplicity is an exception and a rare one, but the two-to-one and the three-to-one and five-to-one cases are common. One maker forms the valve lifter guides integral with the upper half of the crankcase and incidentally gets along with twenty-four fewer pieces in this part of the motor than his competitor, who has a separate guide for each of the eight lifter rods, and requires two studs to retain each guide in position. Another maker employs six castings in his gearbox whereas his rival uses but three and has a stronger, lighter, more compact and cheaper gearcase. Mr. A builds a selective set with but four pieces forming the linkage between the gear-shift lever on the side of the car and the pinion in the gearset that he slides upon the shaft; Mr. B on the other hand, by actual count employs twelve between the lever and the gear he slides. It is more expensive to make twelve than four, it takes longer to assemble them and the car containing twelve cannot be sold so cheaply as that with four providing other things are equal.

BUT simplicity is not the only virtue of the circle and hence of the perfect car. The circle is a most accessible figure—one point is as accessible as another and in fact if you get in the center all parts of it are equally accessible and equally distant from you. It might be hard to discover the accessibility center of a motor car; some have none, others may have, but they are sadly obscured. In one car the carbureter is so low down among the framework of the chassis that the mud apron has to be dropped to adjust the carbureter, but the salesman declares it is all right because the carburcter never needs adjustment. Maker No. 2, more considerate, cuts a small door in the mud apron large enough to admit the hand so that the carbureter can be adjusted through it; maker No. 3 hangs the hot exhaust pipe so low on the carbureter side that to get at the needle valve adjustment would be as risky as picking pins off a red hot stove. So goes the story of accessibility, this being but a prelude to one of the many chapters that a consecutive study of the motor car would lead to. Mr. Z fits his water pump so that it cannot be removed without taking the radiator off; Maker X cannot drain the oil out of the crankcase without taking the lower half off; and Mr. Y cannot lubricate the multiple disk clutch without taking the cover off the selective gearset. In pleasing contrast with such inaccessibilities are the makers who have transported themselves into the boots of the buyer, who after having run his car months discovers that the brakes have to be adjusted or the clutch spring tension increased and have made provision whereby such can be done without visiting a garage or calling into action a phalanx of wrenches and other tools.

FOR two years it has been strength and power that have sold cars. Makers realized it was nickle steel, chrome nickle steel, vanadium steel, tungsten steel and high carbon steels that sold cars rather than simplicity and accessibility. But these steels are common properties of the high-priced machine and so something else must be done; this something else is being done and in many cases is taking the form of simplicity and accessibility. In medium-priced machines for a season at least drop forgings have been a leading subject, but now simplicity and accessibility are being talked. In cheap cars power and speed were magnified but the maker has learned that to make these possible simplicity must be looked after.

CHICAGO PREPARES FOR COBE TROPHY RACE

Indiana Course Is Inspected, Committees Appointed and One Entry Already Received

CHICAGO, March 17—The announcement from Boston that the executive board of the American Automobile Association at its meeting there last Thursday had accepted the deed of gift of the Cobe trophy, donated by Ira M. Cobe, president of the Chicago Automobile Club, for a national stock chassis race, has aroused the local organization to renewed energy in the promotion of the race that is to be run over the Crown Point-Lowell course in Indiana on May 31. The arrival in town today of Frank B. Hower, chairman of the contest board of the American Automobile Association added to the interest. Mr. Hower came on to discuss the race with the officials of the Chicago Automobile Club and was in session with them the greater part of the afternoon. As to the result of the conference nothing has been given out, but there is to be a confab tomorrow with the directors in which Hower will be the principal figure.

So far nothing has been settled as to the rules that are to govern the contest for the Cobe trophy. The club is in receipt of a set of conditions which was forwarded by Howard E. Coffin, chairman of the rules committee of the Manufacturers' Contest Association, to whom they had been referred by Hower. These rules, however, do not meet with the approval of the Chicago Automobile Club, which points out that they evidently have been framed for a sweepstakes event which it does not wish to promote. Another cause for complaint is the ruling that a manufacturer must have made twenty-five cars of the model he enters before the race is run. As the race is scheduled for May 31 this would shut out 1910 models, several of which already had been promised. The rules also provided for classification either by piston displacement or price. In the former the largest size is 5½ by 6 inches, while the price classification winds up with a class for cars $3,250 in price or over.

One actual entry already has been made for the Cobe trophy, the Walden W. Shaw Co., local agent for the Thomas, nominating a 70-horsepower six-cylinder Thomas, which is to be driven by George Salzman. The Shaw company was informed by the Thomas company that the manufacturing concern will make no entries in road races this year.

The Chicago club has decided that it will not run a sweepstakes for the opening event on May 29, preferring a light car event similar to the one that was run at Savannah last November. For this it has decided to offer the Chicago Automobile Club trophy. As to the engine limitations in this event, no decision has as yet been reached.

An organization to handle the race was completed last week by the appointment of a board of executives which is to work under the supervision of the contest board of the club, which is made up of Joseph F. Gunther, A. J. Banta and C. G. Sinsabaugh. The executive chiefs, as they are styled, are as follows: General executive, Frank H. Trego; finance, Ira M. Cobe; course, N. H. Van Sicklen, Sr.; technical, David Beecroft; construction, F. E. Edwards; house, Burley B. Ayers; hospital, Dr. L. W. Bremerman; diplomacy, Harold H. Wheeler; publication, Fred W. Van Sicklen; publicity, C. G. Sinsabaugh.

A visit was made to the course last Sunday by members of the contest board and several of the executives, among whom were N. H. Van Sicklen, who superintended the construction of the Savannah circuit. In the opinion of Mr. Van Sicklen the Indiana circuit is far superior to the one over which the Briarcliff was run and the equal of the Vanderbilt. The circuit is roughly about 24½ miles, a stone road all the way, and with eighteen turns, most of which, however, come in the first 5 miles. While there are places where cars cannot pass each other, still there are many others where such a thing is possible. On the south leg, for instance, the road is so broad that last Sunday a six-cylinder passed another car at 70 miles an hour and did not have any trouble in doing so.

The residents of Lake county, in which the circuit is located, are almost unanimous in desiring the road race to be run over their highaways; in fact, so far there has not been a bit of opposition, Crown Point even agreeing to boarding up one of its streets in order that the race may pass through there without a control being established. An effort will be made to get Governor Marshall to order out the militia. If this permission cannot be secured, however, the Chicago club declares it will police the course in an able manner.

LEWIS R. SPEARE
New President of A. A. A.

It is planned to have the Cobe trophy race at about 400 miles and to start it at 9 o'clock on the morning of May 31. The light car event will be at half the distance of the main race. An excellent location for the start and finish has been discovered on the last leg of the course and within about a mile of Crown Point. This east leg is a beautiful stretch of 10 miles, a straightaway, over which fast time can be made. It is rolling in nature but the grades are far from being severe. There is another long straightaway on the west leg.

Hotchkiss Out; Speare In

Boston, Mass., March 13—William H. Hotchkiss has resigned the presidency of the American Automobile Association and at Thursday's meeting of the A. A. A. board of directors Lewis R. Speare, president of the Bay State Automobile Association, of Boston, was elected his successor. Mr. Speare for several years has served as vice-president of the A. A. A. He is elected to fill out Judge Hotchkiss' term of office, which expires December 1 next. The latter having been appointed by Governor Charles E. Hughes, of New York, as state superintendent of insurance, the duties in connection with this office do not permit him to properly care for the executive affairs as the chief executive of the American Automobile Association.

At this meeting the Colorado State A. A., comprising six clubs with a membership upward of 650, and the South Dakota Motor and Vehicle Association, comprising six county motor clubs with a membership of 300, were admitted to state association membership, thereby making in all twenty-seven state associations affiliated with the national body, and adding nearly 1,000 names to the membership of 20,000. The Lookout Mountain Automobile Club, of Chattanooga, Tenn., was elected to membership as an unfederated club in the A. A. A.

George C. Diehl, of Buffalo, was appointed by President Speare as chairman of the A. A. A. good roads board and also chairman of the national convention committee, succeeding C. Gordon Neff, of Cincinnati, whose resignation was accepted with regret by the board.

The deed of gift for the trophy for a stock chassis race donated by Ira M. Cobe, president of the Chicago Automobile Club, was, with the approval of the contest board, gratefully accepted, and was referred to the contest board with power to conduct the race, which is to be run annually until the same person wins it twice. Only members of the clubs in the A. A. A. can compete for the trophy, and during the next 2 years the race must be run within 50 miles of Chicago. The distance must not be less than 250 miles, and it cannot be held on any horse or bicycle track.

FOURTEEN OUT OF TWENTY CARS PERFECT

BOSTON, MASS., March 15—The endurance run from New York to the Boston show was a big success when it is considered that fourteen of the twenty competing cars finished with perfect scores. It was a tough run, for the weather was cold and the roads were not in any too good condition.

It was shortly after 6 o'clock Thursday night when the first cars began to arrive in Boston and before 7 nearly all of them had been accounted for. There were some accidents. Paul LaCroix driving the Renault was held up in Connecticut for the accident to A. W. Wallace, but he disclaimed any knowledge of the affair which caused the death of the Connecticut man. Later he was acquitted.

On the run from Worcester to Boston E. P. Blake, the New England distributor of Jackson cars, was driving a new machine with F. Ed Spooner and M. B. Richardson in it when they were overturned at Marlboro. They had gone to Worcester from Boston to meet the contestants and they were on the way back. The car struck some soft dirt turning a corner and skidded across the road and turned completely over. Blake was injured so he had to go to a hospital in Marlboro, and he is there yet. He was not very seriously injured, but he is such a large man that he felt the shock. Richardson stayed at a hotel in Marlboro over night and had a physician treat him for bruises. Spooner was shaken up and hurt his ankle, but he insisted on going to Boston to be in at the finish.

Penalizations of Cars

When the cars checked in it was found that Lozier had lost 2 points at Worcester, the Haynes 6, Renault 16, Coates-Goshen 50, Kisselkar 264 and the Atlas 200. The cars and drivers that finished with perfect scores were: Mora, W. W. Burke; Acme, A. B. Cordner; Matheson, A. D. Hall; Franklin, C. S. Carris; Stearns, Guy Vaughn; Knox, Al Denison; Zust, V. P. Pisani; Premier, Ray MacNamara; Matheson, C. S. Rothfuss; Cadillac, L. R. Burne; Cleveland, J. T. Miller; Cadillac, H. A. Street; Maxwell, C. W. Kelsey; Stearns, M. W. Betts.

Renault Files Protest

The Renault people protested their penalization on the ground that they were not responsible for the accident, and they should not have been held up. Referee L. M. Bradley has not given a decision on it yet. The Lozier people also protested, but as they did not enclose the protest money no more notice was taken of it.

It was proposed to have the drawing for the cup take place at the show Friday night, but this was postponed until the cars got back to New York.

As an aftermath of the endurance run of the cars from New York to Boston during the show Manager C. I. Campbell received a letter from Secretary A. B. Fletcher, of the Massachusetts highway commission to the effect that if upon investigation it was found that any of the dealers or drivers registered in the Bay state had violated any of the laws relative to reckless speeding or fast driving that their licenses would be revoked. As a matter of fact the laws of the Bay state were respected and the drivers did not indulge in any bursts of speed except in a few places. Springfield people made a kick because some of the drivers raced through there too fast, but otherwise there was no trouble.

NEW YORK-BOSTON RUN—START FROM NEW YORK

DETROIT RELIABILITY PROGRAM

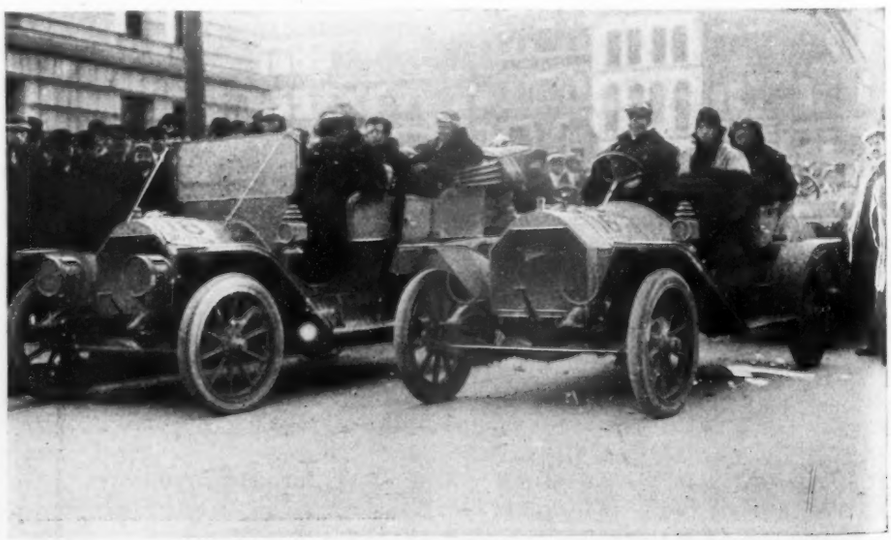
Detroit, Mich., March 15—Arrangements have been perfected for the second annual reliability run of the Detroit Automobile Dealers' Association, which will be held on May 10, 11, 12 and 13. The tour differs from last year's in many details. Instead of making overnight stops in the various towns and villages in the state the contestants will park nightly at the Hotel Tuller, in this city, headquarters of the association. Also, the tour is 1 day more than in 1908. The plan whereby the tourists will park nightly around the hotel will make it more of an endurance test on the cars and less on the drivers and observers, who last year were given an allopathic dose. The weather happened to be bad, and to make it all the worse many of the tourists had to roam about looking for quarters after attending to their cars. The committee in charge has made up this program for the run:

Monday, May 10—To Port Huron, via Mt. Clemens, Marine City and St. Clair, returning via Capac, Romeo and Utica.

Tuesday, May 11—To Jackson, via Ypsilanti and Ann Arbor, returning via Adrian, Tecumseh, Saline and Ypsilanti.

Wednesday, May 12—To Flint, via Pontiac and Lapeer, returning by the same route.

Thursday, May 13—To Lansing and return, via the Grand River road.



NEW YORK-BOSTON RUN—CHECKING STATION AT WORCESTER

PERMIT GIVEN FOR FAIRMOUNT PARK RACE

PHILADELPHIA, PA., March 14—Thanks to the clean-cut manner in which the Quaker City Motor Club ran last October's 200-mile stock chassis race in Fairmount park, there was very little opposition in evidence at the meeting of the park commissioners last Thursday when the club's plea for permission to run another race October 7 next came up for consideration. Indeed, the entire opposition was crystallized in the personality of one lonely commissioner, James Pollock, but he stuck to his guns throughout, despite the overwhelming odds and on the final vote his was the only ballot registered against granting the permit.

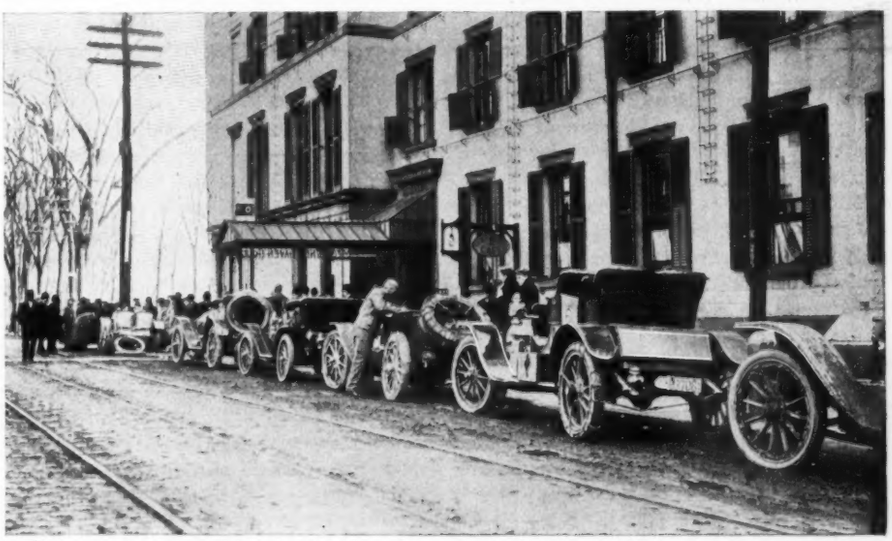
With but few exceptions, the course and the rules governing the event will be practically the same as those last year. The mayor is in favor of the project—indeed, he exerted his influence to have the matter acted on favorably by the park commissioners—and will allow the use of the city police to guard the course. The comparative shortness of the course—a trifle under 8 miles—will limit the number of possible starters, as before, to fifteen.

The club's new contest committee, at its meeting last Friday afternoon not only outlined the general plans for the big race, but decided upon a schedule of events which promises to keep Philadelphia prominently in the eye of the motoring world during the coming year. First of all, there will be a roadability run in the latter part of April. Then will come the spring endurance run—a 4-day affair to Pittsburg and return—scheduled for May 19 to 22, inclusive. This event, which will give the competitors an opportunity to study the relative merits of the two proposed routes for the Lincoln highway across the state, is to take the place of the usual spring track meet. As a wind-up to the year's activities, the fourth annual winter endurance run will be pulled off on December 29 and 30, the desire to avoid Sunday competition necessitating the abandonment of the usual New Year's day start.

Altogether the Quakers' schedule is a most ambitious one, but with their usual energy the members of the contest committee are already at work on the details of the earlier events. The itineraries for the roadability and endurance runs will be announced within the next fortnight.

NORRISTOWN RUN PLANS

Norristown, Pa., March 14—Work on the details of the endurance run of the Norristown Automobile Club, scheduled for May 18-19 next, is progressing rapidly. The route as finally selected provides for checking stations at Coatesville, Lancaster, York, Frederick and Hagerstown, the overnight stop, and at Gettysburg, Harrisburg, Lebanon, Reading and Pottstown on the return trip. In round numbers the distance to be covered in the 2 days will be 400 miles—190 the first day and 210 the second. There will be two classes of entries—one for the trade, subdivided into touring cars and runabout classes; the other, open to club members and non-trade members of the A. A. A. Already the contest committee claims it has assurances sufficient to warrant the statement that, as regards the number of entrants, it will be the largest event of the kind ever held in the country. The following officials have been selected to manage the run: Referee, John H. Rex, president of the club: business manager, Oliver F. Lenhart; starter, Wayne Davis; assistant starter, Prothonotary A. D. Hallman; chief checker, Earl Wentz; associate member A. A. A., Harry Lasher. The technical committee is composed of Linn de Haas, Harry Lewis and Lawson Bullard. The pathfinding trio of cars will go over the route on March 31 and April 1 and 2, traveling leisurely and making all necessary arrangements for checkers en route.



NEW YORK-BOSTON RUN—AT NEW HAVEN

NEW YORK-BOSTON RUN—FINISH AT BOSTON

MAY BAR WOMEN FROM GLIDDEN

New York, March 16—That women drivers may be barred from participation in the future Glidden tours is probable, the American Automobile Association having issued the following statement: "The contest board is in receipt of a request from representative motor car manufacturers who met in New York recently, that the board adopt the rule that only males of 18 years or over be eligible to take part as contestants or drivers in the annual tour of the American Automobile Association. The board has taken the request under consideration but has announced no decision as yet. However, in view of the cordial relations existing between the manufacturers and the contest board, it would be regarded as discourteous, to say the least, to refuse compliance with its request."

LOS ANGELES-SEATTLE RUN IS PLANNED

LOS ANGELES, CAL., March 5—The motorists and dealers of southern California have in contemplation a summer tour from Los Angeles to the Alaska-Yukon-Pacific exposition, which is to be held in Seattle. The dealers' association has never failed to promote an event of some kind during the summer and this season the big contest may be an endurance run to the northwest. There have been tours, contests and runs of all kinds to every point in southern California. The motorists have been asked to participate in a reliability run to Santa Barbara. Three times they have crossed the mountains and skirted the coast to San Diego. Once they went around the "kite," which takes in the towns of Pomona, San Bernardino, Redlands, Riverside and Santa Ana. Last year over twenty machines made the tour to San Francisco and return. Many motorists are already planning the Seattle trip. They would be only too willing to join a larger party.

Makes Good Vacation Trip

Many dealers could make this their vacation trip and all in all there is everything to point to a successful tour should it be undertaken. With the endurance and reliability contest as a feature the tour would attract attention throughout the country and almost every factory would be willing to stand the expense of a car in the tour. It would take the machines through the entire Pacific coast territory. Starting from Los Angeles the coast towns would be touched to San Francisco and with a fresh start from San Francisco the northwest would be invaded. Probably a dozen cars from the southern end of the state made this tour to the northwest last summer and with the exposition as an attraction there is every reason to predict that twice that many will undertake the run this season.

In addition to the party from Los Angeles and other southern cities by the local dealers' association co-operating with the dealers' association of San Francisco the Golden Gate motorists could join the Los Angeles party for the 1,000-mile tour to the north. It would be a great thing for California to go into the exposition fifty cars strong. With the co-operation of San Francisco this could be done, as 'Frisco, being almost 500 miles nearer, should send more cars than Los Angeles.

Over a Familiar Route

The trip from Los Angeles to San Francisco is more or less familiar to a majority of the motorists. For pleasure this would require 4 days. The first day would be over the muchly-traveled Santa Barbara road, through Ventura and over the Casitas mountains to the Channel city. For the second day there would be the fifty-seven variety of hogbacks, the Gaviota mountains and the Los Olivos hills, through Los Olivos, Santa Maria and Pizmo Beach to San Luis Obispo or Pasa Robles. The best hotel accommodations are at the latter place. The next stop would be that garden spot, Del Monte, and from there it is a nice run into San Francisco. After the 4 days of travel there should be a rest of at least 2 days in San Francisco before undertaking the really hard part of the run.

The next 1,000 miles require a firm hand at the wheel. There are all kinds of roads and the tenderfoot has no right undertaking to pilot a party in a big car. This does not mean that a professional chauffeur is required, but a man should know his car and have a cool head under all circumstances.

Is an 8-Day Trip

M. C. Barker, of Los Angeles, was among those who made this trip last year. He says the run from San Francisco to Portland should not be undertaken under 8 days. He also advises shipping the cars from Portland to Seattle on account of the plank roads encountered the first day out of Portland.

By putting the cars on the Vallejo ferry at San Francisco 5 hours can be saved. The road out of Vallejo is not bad, but during the summer this is a hot run and cooling beverages will be in great demand. This is a flat country for 150 miles. There are many small towns and there will be little trouble in following the main road. The second day's run is through Red Bluff to Redding. This road is fair and good time can be made. At Redding the road branches off into the mountains. This will be one of the hardest days of the whole run. The road is in fair shape, but it is up one hill and down another. A night stop can be made at Baird where the government salmon hatchery is situated. This is one of the sights of the trip. The road is still winding through the mountains and the scenery is magnificent. Baird is about 300 miles from San Francisco. The mountain road continues for another 50 miles to Shasta Springs, another of the beauty spots of the trip. While the road is still in the hills it continues to improve from here on. One hundred miles can be made easily the next day.

Ahead of the motorist before Oregon is reached are the Siskiyou mountains, with the worst grade of the entire trip. For 3 miles the cars seem to go straight up, it being impossible for the highest-power cars to get out of the low speed. Once over this obstruction the motorists find themselves in the pretty fruit country of Oregon and there will be good running for mile after mile. For 150 miles into Portland the road is fine and fast time can be made.

It will require from 10 days to 2 weeks to make the run from Los Angeles to the exposition. The skeptic might say such a tour is impractical, but J. S. Conwell, of Los Angeles, thoroughly demonstrated otherwise last summer, when he successfully pulled off a 1,100-mile tour from Los Angeles to San Francisco and return. Every car which started came back in good order, and instead of becoming weary with each day of the run the enjoyment became keener. This Tourist tour was a success from every standpoint and the tour to Portland could be made likewise.

Tacoma Is Interested

Tacoma, Wash., March 6—The last few days of May promise to see on the Pacific coast one of the longest motoring endurance runs ever held out here. It will be a run from Los Angeles to Seattle, ending at the gateway of the Alaska-Yukon-Pacific exposition, and so timed that it will end in the northwestern city on the opening day of the great fair—June 1. The distance is 1,300 miles. The promoters of the event are the officers of the Portland Automobile Club, which organization already has attracted attention by its energy and enthusiasm by promoting a long-distance road race at Portland last summer, the first ever held on the Pacific coast. The active worker at the present time is W. J. Lippman, secretary of the Portland Automobile Club. Lippman is even now busy working out plans for the contest and endeavoring to interest motorists and manufacturers all over the country. It was the original plan to end the event at Portland, but the managers of the Alaska-Yukon-Pacific exposition heard of it and realized the interest which would be created by having the finish at the gate of their exposition on the opening day. Consequently the plans were extended. Lippman will go to California and endeavor to interest the co-operation of the motor car organizations of San Francisco and southern California.

CLEVELAND PROSPECTS GOOD

Cleveland, O., March 16—With the buying season under headway in all parts of the United States, Cleveland factories are taxed to the utmost to keep up with the steady demand from all over the country. Briefly, the start of 1909 bids fair to usher in the greatest manufacturing year the trade has ever experienced in Cleveland. The nine factories of which Cleveland boasts—and not one of which produces a cheap car—are all busy from morning until night, and several of them are steadily working night shifts. The newly-organized Royal Tourist Car Co. is starting the new year in good shape, and bids fair to ride on the crest of the prosperity wave all season. The other new concern—the Broc Carriage and Wagon Co., manufacturer of the Broc electric—is pushing its plant, remarkable success having been met ever since the car was presented to the local public at the show last month. Moreover, the Cleveland pub-

lic seems to be taking more interest than ever before in the local product. Every car now being turned out in this city is finding plenty of local buyers—a condition more than pleasing when viewed from a civic standpoint. Further than that, the retail trade is opening up in a way indicative of an extremely prosperous season. Selling is not confined to any one class of machines, although the moderate-priced cars seem to be making considerable headway. A number of new concerns are launching out, and new cars are making their bow to the public almost weekly. Accessory manufacturers and dealers are, of course, feeling the effects of this stimulus as much as the car dealers themselves. With the start secured, 1909 will undoubtedly the best year Cleveland has seen.

OUT FOR 10,000-MILE MARK

New York, March 15—Announcement is made that the Maxwell will be sent out to do a 10,000-mile non-motor stop run some time during the summer, the car selected for the job being a four-cylinder 30-horsepower car geared three and one-half to one. No definite time has been set for starting the run, but the Maxwell people are making arrangements for the big affair. It is intended to make it a night and day test and it is anticipated it will take a month to complete the 10,000 miles. The drivers will be carefully selected and each will be examined by a physician to determine whether or not his physicial condition will stand the strain.

MILWAUKEEANS DISTURBED

Milwaukee, Wis., March 15—Milwaukee agencies are much wrought up over the proposed action of the common council, which would prohibit all display signs extending over the lot lines. Many of the garages and agencies have gone to great expense in erecting electric signs, and these would be a dead loss if the ordinance is passed. A year ago a crusade was started to enforce the sign-regulating law, and hundreds of signs extending more than 3 feet over the lot line were ruthlessly torn down. The present law permits the erection of signs to extend no more than 3 feet over the lot line, but it is proposed to repeal this act.

COLORADOANS BUSY

Denver, Colo., March 15—The Colorado State Automobile Association, which was organized during the recent show at Denver, has been officially notified that it has been chosen as the state representative of the American Automobile Association. The Colorado State Automobile Association is composed of the Denver Motor Club, the Colorado Springs Automobile Club, the Weld County Automobile Club, at Greeley, and the Trinidad Automobile Club. These clubs have a total membership of over 600. Ralph W. Smith, president of the Denver Motor Club, has been chosen as president of the state association.

TEST MADE OF BRAKES

Royal Automobile Club of England Discovers Efficiency of the Front Wheel Type

London, March 6—The results of the official test of the Allen-Liversidge front wheel brakes by the technical committee of the Royal Automobile Club have just been announced, the finding being decidedly favorable to the type, the committee finding that at a speed of 16½ miles an hour there was only a deviation of 4 inches when the brakes were applied, whereas at 16 miles an hour there was a deviation of 15 feet to one side of the true course when the rear brakes only were used. Two cars were used in the test. One of them was a 15-horsepower Humber weighing 2,774 pounds, and the other a 16-horsepower Albion covered van weighing 5,432 pounds. The test was held on an area covering 60 by 30 feet, the granite set floor being covered to a depth of 1½ inches with a mixture of mud and soft soap, affording a more treacherous surface than is usually met with under ordinary road traffic conditions. Two courses, straight and curved, were used.

The Humber first was tried out, the initial test consisting of the car passing over the straight course at a speed of not less than 12 miles an hour, with the clutch out and the brakes off. In this test the car actually went at 16½miles an hour and no deviation in the course of the machine was apparent. Both rear tires were plain, while one of the front ones was plain and the other steel-studded. In the second test, while the car was running 16½ miles an hour, the front wheel brakes were applied, locking the front wheels for 37 feet, the car being stopped when the rear wheels reached the edge of the prepared course. This resulted in a deviation of only 4 inches and that at the extreme end of the course. The rear wheel brakes were then tested in the third trial, the speed of which was 16 miles an hour, and the result was a deviation of 15 feet and when the car was stopped it was facing in the reverse direction. The stop was made in 50 feet. Both brakes were used in the fourth test, the speed of which was 17½ miles an hour. The stop was made in 45½ feet, after the application of the brakes and a deviation of 11 feet was noted, the car being at an angle of 19 degrees to the course. Then the car was sent over the curved course with the clutch out and the brakes off, no deviation occurring. In this, both front tires were plain. Over this same curved course the car was sent in the sixth test at a speed of 16 miles an hour, the front brakes being applied. The front wheels were locked, which caused the car to continue a straight course, instead of following the marked curved one.

Five tests were given the van. First it was tried with the clutch out and the brakes off and it kept a straight course. Then it hit 12 miles an hour and the front brakes were applied, the van keeping a perfectly straight course and being stopped in 49 feet. In the third test the van went 12½ miles an hour and both front and rear brakes were applied, the stop being made in 18½ feet. There was a deviation of 10 inches, which was corrected, and the van when stopped was in a straight line with its original course. Then the curved course was tried at 12 miles an hour. The front wheel brakes locked the wheels, which then side-slipped, and the car went straight on. The verdict of the committee was that the brakes were effective and did not interfere with the steering unless the wheels were locked.

AFTER FREE FERRIES

Hartford, Conn., March 15—A hearing on the freeing of Connecticut river ferries was given at the state capitol on Wednesday afternoon of last week. Interested parties of several towns along the river were present. Some favored the freeing of the ferries while others would be content to have them acquired by the state. That at the mouth of the Connecticut river is perhaps best known to the motoring fraternity en route to New York and Boston by the shore route. The present Lyme ferry is inadequate to the demand. That it was well patronized by motorists is apparent from the statement made by Representative John H. Noble, of Old Lyme, who remarked that between 7,000 and 8,000 motor cars had been ferried across the river during the past season. As there are no traffic bridges across the Connecticut river south of Middletown, the question is of more or less consequence to motorists in general who are attracted to the picturesque regions of the lower Connecticut valley which have become more generally appreciated since the development of the motor car.

DALLAS GOOD MOTORING CITY

Dallas, Tex., March 13—This city, with a population of 100,000, is one of the leading motor cities of the state. In all, 700 cars were sold last year, the majority in the city, and many scattered throughout Dallas county. The city has substantial pavements and the roads in the surrounding county are good, two facts which combine in promoting motoring in this section. Going south good roads extend as far as Waco, 100 miles, and north to Sherman the roads are equally good. Up to the present time the big sales have been in cars ranging from $1,500 to $2,500, although one or two makes at $3,000 to $3,500 have sold well. For the present season, the big demand will be in $1,500 machines, practically all of which are manufactured in the country are represented here.

Legal Lights and Side Lights

WANTS INSURANCE AS BOND

IN the New York state legislature at Albany, Assemblyman Marks has introduced an act compelling owners of motor vehicles in the state to file with the secretary of state at the time of receiving his license, an insurance policy for $10,000. This policy is to be available to cover losses to persons occasioned by the owner or driver of the machine so licensed, and no part of it is to be paid to the owner or driver or any of the occupants injured in such accident. It will be available to all persons receiving injury from said machine, but at the same time will not prevent a civil action for damages against the owners of the motor vehicle. It is considered as rather drastic legislation and will be strongly opposed. The act has been read once and referred to the committee on general laws. Sections from the act as introduced read as follows:

Every owner of a motor vehicle operated in this state shall first procure from the secretary of state a license to operate the same, which license shall be granted upon compliance with the sole condition precedent, that said owner shall present and file with the secretary of state an insurance policy in the principal amount of $10,000, available for compensation for all losses and damage arising from any one accident, issued by an insurance corporation authorized to do such insurance business in this state, to such owner, upon his application, the terms and conditions of said policy being that the insurance corporation issuing the same shall be liable to pay all damages to the person or property of the person or persons injured, other than the owner, chauffeur or operator or other person in or on said motor vehicle, arising out of the operation of said motor vehicle, during 1 year from the date of issuance of such license, such insurance to be valid and binding without regard to the negligence of said owner or of any other person in operating such motor vehicle, or to the contributory negligence of the person killed or injured, or of the owner of the property destroyed or damaged, and the liability on the part of such insurance corporation shall be binding, unless such damage was due to the wilful act of the person killed or injured, or of the owner of the property lost or damaged, as the case may be. Such insurance shall in no way abate the right of any person injured or whose property is destroyed or damaged, or of any person claiming on account of the death of another, to recover damages, due to the negligence of the owner or operator of said motor vehicle, but whatever sum or sums shall be paid to such person under and by reason of said insurance policy shall pro tanto be a release of the owner of said motor vehicle from his liability, if any, for his negligence. Said insurance policy shall further provide that in the event of the death or of the injury to more than one person, or of damage to the property of more than one person or both, arising out of one accident in the operation of said motor vehicle, the aggregate of all such damages exceeding the said sum of $10,000, then the said sum of $10,000 under such policy shall be distributed by said insurance corporation among the persons injured or damaged, and the persons claiming because of the death of another person or persons, in proportion to the amounts of their said respective damages; provided that notice of the said claims shall have been given to said insurance corporations within 1 month after the happening of the accident which caused said damage and that proofs of loss have been filed within 2 months after said accident; and in event that the entire sum covered by said insurance policy shall not be required, in order to discharge all said claims, notice of which shall have been given within said 1 month and proofs of loss filed within said 2 months, then and in that event, the remainder of said sum not so required shall be available to pay all damages to any other person or persons who suffered damage by reason of said accident, and who shall thereafter give notice and file proofs of loss within 1 year after the happening of said accident. Said insurance policy shall further provide that said insurance corporation will pay damages as herein provided for, upon proof that the damage arose out of the operation of the motor and propf as to the amount of said damages only, and said insurance corporation shall not plead or otherwise assert by way of defense or of reduction of amount of liability, the absence of negligence on the part of the owner or operator of said motor vehicle, nor any contributory negligence of the person killed or injured or whose property is destroyed or damaged.

Upon the filing of an insurance policy, as provided, the secretary of state shall issue a license good for 1 year, to the owner of such motor vehicle, upon payment of a fee varying according to the horsepower of said motor vehicle, as registered with the secretary of state, according to the following schedule of fees: For a motor vehicle of 10 horsepower or less, $5; for a motor vehicle of 30 horsepower or less, but more than 10 horsepower, $10; for a motor vehicle of 60 horsepower or less, but more than 30 horsepower, $15; for a motor vehicle of more than 60 horsepower, $25. In the absence of evidence to the contrary, the certificate of the maker or dealer who sold such motor vehicle shall be taken and accepted by the secretary of state, as proof of the horsepower of the same. The amount of the fee for a license to be paid by each chauffeur to the secretary of state shall be $3.

All license fees from owners of motor vehicles and chauffeurs received by the secretary of state as herein provided, shall be used for the improvement, maintenance or construction of highways, streets, and thoroughfares in this state, and shall be distributed in manner as follows: At the end of each quarter year, the amount of such fees received by the secretary of state shall be computed and ascertained, and a moiety of the amount received from residents of each county of the state shall be paid over to the proper custodian of highway construction and maintenance funds in each said county of the state, for the purpose of such improvement, maintenance and construction, and the remaining moiety shall be turned over to the state treasurer to be used by the state highway commission in its discretion for like purposes.

MUST GIVE PART OF ROAD

The Indiana legislature, which adjourned last week after a 2 months' session passed two laws of special interest to motor car owners. One of these provides that vehicle drivers shall turn to the right upon hearing a motor car approaching from the rear and provides heavy penalties for driving cars while intoxicated; the second measure repeals the 3-mile road law. Under the old 3-mile road law, about $8,000,000 a year was spent for road improvements in the state. It provided that upon the petition of fifty property owners, the county commissioners must order an improved road not more than 3 miles long, providing it would connect at each end with improved roads. The expense was assessed against the property owners of the whole county. In repealing this law, a new one was enacted, providing that upon the petition of fifty property owners in a township, the county commissioners shall order an election to determine whether or not a road shall be built. However, if fifty-five or more property owners file a counter petition, the commissioners need not order the election. The cost of roads made under the new law is to be assessed against the property owners in the townships in which the roads are built.

WANT WHEEL TAX IN CAPITAL

Motorists in Washington, D. C., are considerably worked up over a provision in the district appropriation bill which goes into effect on July 1 next. Among other things this bill provides that there shall be assessed and collected an annual wheel tax on all motor cars owned and operated in the District of Columbia having seats for only two persons the sum of $3, and on all such vehicles having seats for more than two persons an additional tax of $2 a seat. It is expected this new law will produce a revenue of about $36,000 a year, not including the revenue that will be derived from the dozen or more sight-seeing cars that will have to pay about $100 a year each. This provision was slipped into the bill without the knowledge of the motorists and was enacted before they could get their forces to working. As it is class legislation pure and simple, strong efforts will be made to have the provision set aside.

TAXING BY HORSEPOWER

The committee on roads and bridges of the Massachusetts legislature started the ball rolling toward enacting new motor laws by giving a hearing on the proposed new bills embodying taxation of cars according to horsepower last Thursday. As the men identified with the trade were unable to be present the committee continued the hearing after those in favor of the bill had a chance to be heard. In many respects the hearing was much the same as last year. Colonel William D. Sohier, of the highway commission, had charge of the forces lined up in favor of the bill, but when the hearing finished it seemed to have been weaker than a year ago. This year W. A. Thibodeau and Judge Keyes were at the hearing and when some of the speakers talked of being in favor of the bill they were asked questions that bothered them.

Chairman Harold Parker, of the highway commission was the first speaker, and he told of the work of the commission and gave facts and figures showing how destructive the motor cars were to the roads. He was followed by such men as Francis Peabody, Jr., Richard M. Saltonstall, both Mr. Stone and Mr. Webster, of the firm controlling many of the electrical properties throughout the country, and several others. Mr. Peabody sought to draw a parallel showing how unfair it was to say it was double taxation, by citing the case of a man owning a house and the man owning a car, saying that the house did

not go out and destroy the roads. However, he neglected to say that the owner of the car spent his money all along the way in hotels, garages, etc., while the house being stationary never produced anything except for its owner.

Mr. Saltonstall is a lawyer, and he was asked if he believed in double taxation, and he had to admit that on general principles he did not. Mr. Stone was asked if he thought it would be fair to place an additional tax on one of his electric properties if some company that competed with him went free, and he was perplexed for an answer.

George Sargent of the Safe Roads Association stated that eighty-five members of his association were in favor of the bill and he gave the committee a lot of figures to ponder over. He was asked what sort of members comprised his association and he admitted they were of the wealthier class.

Colonel Sohier ended the hearing by giving some good plain statements as to what the commission needed and why the proposed bill was one that would meet the requirements at present. He said unless the state gets more money this year in a few years there will be no good roads and with poor roads there will be fewer cars used so that the dealers were unwise to oppose the bill.

CHICAGO WHEEL TAX SITUATION

The Chicago Automobile Trade Association has filed an application for a rehearing of the Chicago wheel tax case which was decided against the motorists last month by the Illinois state supreme court, which action gives the dealers' association an opportunity to get its second wind before engaging in the sharp legal battle to finally decide the validity of the ordinance. It may be the present case will not be pushed and that instead an appeal will be made to the legislature for relief or else the city may be asked to modify the ordinance which is found so oppressive by the motorists. Contributions still continue to be sent to Henry Paulman, treasurer of the wheel tax fund, who on Tuesday had in his possession $1,424.50, which has been subscribed by 669 contributors, 163 of whom are not residents of Chicago.

MISSOURI'S LATEST

What is generally considered as Governor Hadley's idea of motor car legislation has made its appearance in the shape of a bill introduced in the Missouri legislature this week. The primary object seems to be to supply more revenue for the state by increasing licenses of both cars and chauffeurs. By the provisions of the bill, there is created a new official, to be known as motor vehicle commissioner, appointed by the governor. The commissioner is to appoint three deputies known as first, second and third-class deputies. While revenue is the purpose of the act, it carries a clause asking $30,000 to fit up offices and provide license tags. Registration of motor cars in the usual way is to be required, for which the fee is to be $2. Three classes are provided for motor cars: For class 1, cars having a carrying capacity of three or more passengers, there is to be a license tax of $50; for class 2, including cars with less than three passengers capacity and also sight-seeing cars of any capacity, the license is to be $25; for class 3, including any sort of car which does not fall into the other two classes, the license is to be $12.50. Chauffeurs are to pay an annual license of $10 and the bill imposes rigid restrictions as to age, experience and identification. Minute rules as to the operation of cars in country and city also are laid down. In the open country 25 miles an hour is to be permitted, in the cities 10 miles in business portions and 15 miles in other parts, and at crossings 6 miles.

ANSWERS MARYLAND'S GOVERNOR

W. B. Littleton, a prominent motorists of Hagerstown, Md., and a member of the Hagerstown Automobile Club, has come back with an answer to Governor Crothers, who, last week, expressed himself as being thoroughly in favor of the Swann motor vehicle bill. Mr. Littleton presents very clearly the motorist's side in the controversy over the proposed bill. He says:

"First, the governor declares the license provision in the bill is just and equitable; that its regulations as to speed, etc., are necessary for the public good. As to the justice and equity of the license feature, I differ and will later on give my reasons. I have no fault to find with the speed regulations. The governor says the motor car people are making a mistake in opposing the bill. He says, 'They are agitating a matter in which they should coöperate, and which agitation will react upon them if they are not careful.' This seems to me in the nature of a threat on the part of the governor, and I would respectfully call his attention to article 6, constitution of Maryland, viz.: 'That all persons invested with the legislative and executive powers of government are trustees of the public, and as such, accountable for their conduct; wherefore, whenever the ends of justice are perverted, and public liberty manifestly endangered, and all other means of redress are ineffectual, the people may, and of right ought to reform the old, or establish a new government; the doctrine of non-resistance against arbitrary power and oppression is absurd, slavish and destructive of the good and happiness of mankind.'

"Under this article I claim that the enactment of the Swann motor vehicle bill would endanger my public liberty to the extent that I am debarred from traveling the public highways of the state in a vehicle which is my personal property, and is so taxed, without first paying a special tax to the state of $24 a year, and after paying such special tax, I am still debarred from operating this vehicle until I have paid an additional tax of $2 a year, making $26 that I must give up for the privilege of traveling a public highway that my neighbor with a horse, buggy, carriage or wagon can use absolutely free. I claim this is class legislation, therefore, unconstitutional, and under the above named article 6, I have the right to resist insofar as I am able. The governor will possibly claim that this bill may be made constitutional under the plea of police protection.

"I believe, and I think that every fair-minded motorist in the state will so agree, that we need and must have a law governing the use of motor vehicles, and we are perfectly willing to pay a reasonable tax per year, under the head of police protection, and we believe that $3 per year, in addition to the personal tax, is more than sufficient to cover the expenses of registration of each machine. Any tax, therefore, in excess of actual expense for registration for police protection would, in my opinion, make such a law unconstitutional. We do not deny that 'we owe something to the state,' as the governor puts it, and we pay our personal tax, in many instances on an assessment at twice the amount our machines would bring if put on the market. The governor further claims that 'it is no argument for us to say that we object to paying taxes and that this is not a matter of double taxation,' giving as an illustration the merchant who pays a special tax in addition to the tax on his property, and the street car company, which pays a license in addition to its general levy. These are not parallel cases—in fact, they have no bearing on the subject. The merchant buys his stock and sells at a profit. The street car is a public carrier, collecting fares from its passengers, while the motor car is a private vehicle for the use of the owner and his family."

SPECIAL SESSION CALLED

The Wisconsin legislature is having its hands full with an investigation of the recent primary election for United States senator and the result is that legislation of importance to owners has been neglected. It is planned to hold a special session in June, the present regular session to end May 1. There is a possibility, however, that motor legislation will be taken up as soon as the investigation is finished. The steering committee of the legislature has already decided to take up four important subjects before adjournment, and that is highway improvement and general good roads legislation. This is causing gratification to owners. James T. Drought, secretary of the Milwaukee Automobile Club and the Wisconsin State A. A. has just issued 4,000 circular letters to owners in the state, asking them to use their influence to defeat pernicious legislation. Mr. Drought also appeals to individual members to go before the legislative committees and argue against bad and argue for good legislation. The Milwaukee club did all of the work in this direction last year.

EUROPE BRINGS OUT MANY NEW NOVELTIES

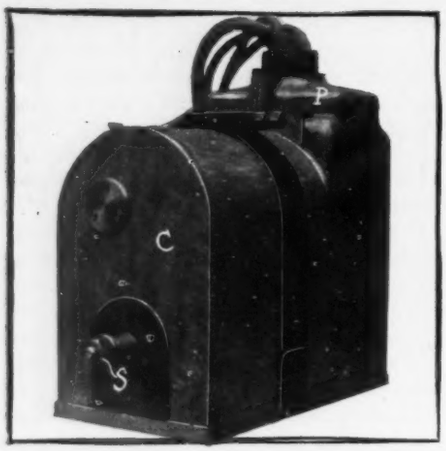


FIG. 1—MAGNETO COVER

PARIS, March 6—One of the latest novelties seen in Paris in the ignition line is a hammered brass case used as a waterproof cover for the Bosch magneto. The necessity of this has been apparent in marine work for some time, but only recently has it been brought into the motoring sphere. The case C, Figs. 1 and 2, fits tight over the magneto bed, which is provided with a raised waterproof beading, and the only projection is the driveshaft S at one end, and the timing lever L at the opposite end. A metal strap S passing over the top of the cover serves to hold the cover on as well as securing the magneto in place. A separate cover P is provided for the contact plugs, and the four or six insulated leads enter this cover through one opening which also has been made water-tight. Oil holes are provided in this casing, so that rarely there should be any necessity of removing it. The firing of the cylinders can be verified by withdrawing the two bolts holding the cap P in position.

It would almost appear as if the friction brake on the car's rear wheels will soon become obsolete, if a brake device just produced by the Peugeot company proves a success. The latest Peugeot device is an aerial propeller, not unlike that used to carry aeroplanes through the air, although in this case it is used to stop the speed of cars. The propeller consists of two flat steel blades B, Fig. 3, mounted at the end of a short vertical shaft S, so that the propellers are underneath the center of a car, the housing for the vertical shaft being attached to a crosspiece of the frame immediately in the rear of the engine. In its experiment this propeller brake was fitted to a Peugeot truck with side chain-drive, and the propellers were driven from the gearset by a horizontal shaft carried forward to the position of the aerial propeller, where bevel gears transmitted to the shaft S. Whenever the car is in motion the propeller is driven from the road wheels through the gearset in the propellershaft. Provision is made to engage or disengage the propeller as desired by lever mounted on the dash, Fig. 4. In a test the truck with a 3½-ton load was allowed to run from the top of Mount Valerin, a high hill overlooking Paris, to the banks of the Seine river. This is a total distance of 2 miles and it was covered at less than 3 miles an hour without the driver having to use the ordinary set of brakes. The great value of this aero-brake is that there is no unnecessary heat set up in any part of the car because of continued use, and the efficiency remains the same, irrespective of the length of time occupied; whereas, with the friction brake acting on a drum the efficiency decreases with use. The Peugeot company has stated that it intends to bring out a brake of this type in which the propellers will operate in some liquid. On the aerial one in use the brake was applied from a lever on the dash.

France never has given much attention to friction-driven cars, but one of the latest of this type, the S. P. M. A., has created considerable comment. This car uses a four-cylinder motor, located in front under the bonnet. In rear of the flywheel is a universal joint from which a long propellershaft extends direct to the rear axle, where the entire friction system is inclosed in a housing H, Fig. 5, not unlike that employed to inclose the differential of a shaft-driven car, although somewhat larger. Fig. 6 illustrates what is within this housing. On the end of the propellershaft is a solid steel wheel W, which can be moved backward and forward as the sliding gears in any gearset, the shaft carrying this being supported in bearings at each end of the case H. On each side of this friction wheel are the friction disks D.

The friction between these disks and the wheel is obtained by means of coil springs carried within the axle casing B, and which are contracted by eccentrics controlled by the linkage L, ending in a pedal on the driving footboard of the car. The changing of speed is occasioned identically as in a regular gearset car, namely, depressing a pedal, releasing the spring tension on the disks D, and then by side lever sliding

FIG. 2—MAGNETO COVER

the friction wheel W to the point giving the desired speed. This set gives five forward speeds with one reverse, and is illustrated in neutral position, at which time the friction wheel W rests in hollows in the center of the disks. The entire set is inclosed in the aluminum housing H, Fig. 5, in the top of which is a small inspection plate, or cover.

The housing B contains the shafts to which the disks D attach, and beneath them are the axle tubings A, which do nothing but carry the dead weight of the car; while the live axleshafts are inclosed in the housings B. The reader will understand that the rotation of the wheel W in the direction of the arrow will drive the disk on the right side in the direction of the arrow on the periphery and that the disk on the left side in the opposite direction, as indicated by the arrow. This opposite motion of the road wheels is overcome, however, in that the driveshafts within the housings B do not drive the wheel as in the conventional live axle, but carry pinions on their ends which mesh with inclosed gears on the road wheels. On one side an idler has to be interposed in order to give the forward direction of the wheel on that side. This car is without a differential. The total weight of the chassis is 1,210 pounds.

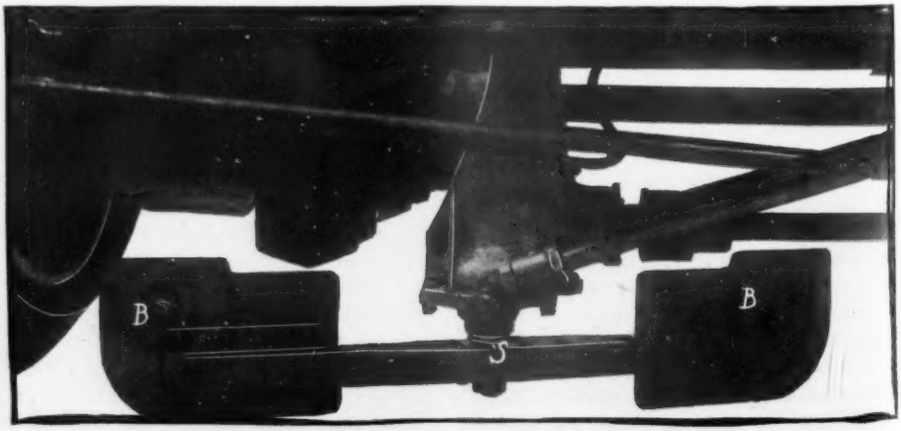


FIG. 3—PROPELLER BRAKE USED ON MOTOR CARS

Every trained motorist knows the sound of his own car sufficiently to distinguish it from a crowd of others although invisible to the eye. But how many professional chauffeurs can correctly name fifteen different cars merely from the sound of their open exhaust? A Parisian journal believes that there are sufficient experts in the music of the exhaust to warrant the holding of a competition. About fifteen different cars, varying from the modest one-lunger to the powerful six and four-cylinder monster, will be gathered in a large garage some Sunday morning toward the end of the present month. The competitors will be in adjoining rooms, where they can hear distinctly, but see nothing. As a preliminary test each of the engines will be started up and run for a few minutes with open exhaust, the competitors listening attentively and taking notes if they desire. The real test will then commence. Each engine will be run for 2 or 3 minutes with open exhausts, the competitors to write down on a slip of paper the name of the engine they believe to be at work. The competitor having the largest number of correct replies will be the winner. The event doubtless will be keenly contested, but will of necessity be confined entirely to professional chauffeurs and repair men. The average motorist, who may be an expert at distinguishing the make of a car from its noise on the road, has little opportunity of becoming familiar with the roar of its engine alone. Even the exhaust cut-out would be more familiar, for the length of piping before the cut-out is reached has a considerable influence on the sound, and this is more frequently heard than the directly open exhaust.

BUSINESS CHANCES IN NORWAY

Washington, D. C., March 13—Promoters of the motor car show to be held at Christiania, Norway, in May have invited the United States to send a representative exhibit of American motor cars. In extending the invitation one of the American consular officers took occasion to point out some of the mistakes that have been made in introducing American cars in Norway. He sets forth that the exposition will present a good opportunity for American manufacturers to display their machines in Norway, and to lay the foundation for a permanent trade. Motor cars are coming into general use in that country and American manufacturers should be able to secure their share of the trade. Several different makes of American cars are offered for sale in Norway, but for some reason or other the sales are not as many as reasonably might be expected. One reason is that American manufacturers give too large a field to their representatives; there are too many agents and subagents, and all of them must have a commission. Then, again, there are too few American cars in the hands of dealers for display to the interested public. It is difficult to effect sales by the aid of printed matter only. Furthermore, the trade is not conducted in a properly systematized manner. A case in point will illustrate this.

A civil engineer, a man in good standing and interested in the introduction and sale of American motor cars in Norway, applied directly to an American manufacturer for the agency for his cars. He was referred by the manufacturer to an export house in New York, with whom he carried on a lengthy correspondence. When finally a hurry call for certain information was sent by cable, the export house by mail referred him to a European agent in Paris, who in turn referred him to a local agent at Christiania. Although the engineer had closely followed the motor car trade and read all advertisements, he had never been able to learn that the local agent referred to was agent for the sale of the cars which he sought for. In the meantime the order was filled by a French manufacturer, although it was plain that the American car would have been preferred if all the delay had been avoided.

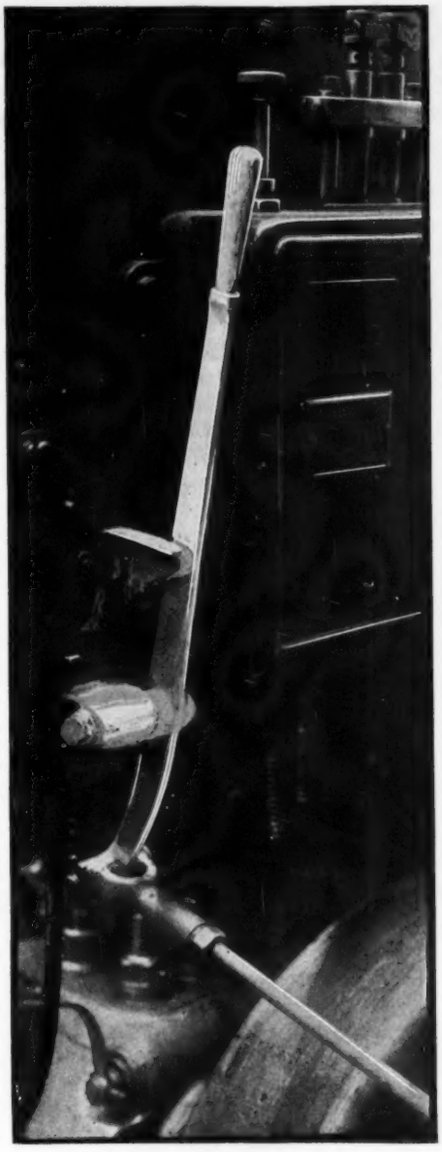


FIG. 4—PEUGEOT BRAKE LEVER

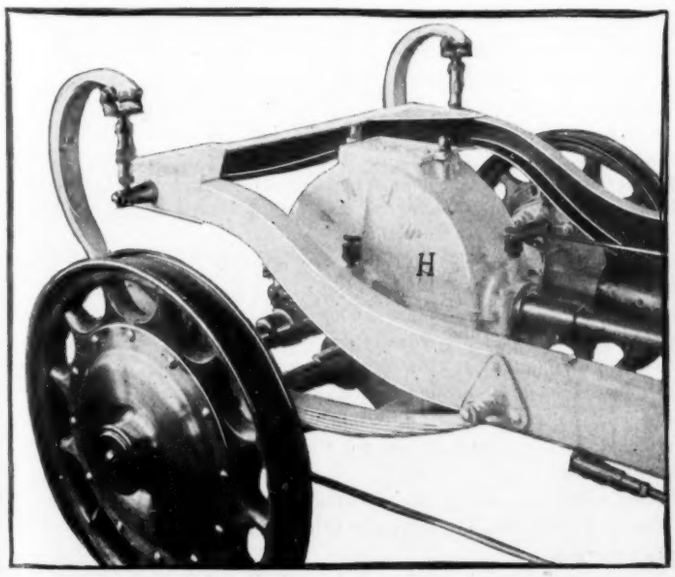


FIG. 5—REAR AXLE OF FRENCH FRICTION-DRIVE CAR

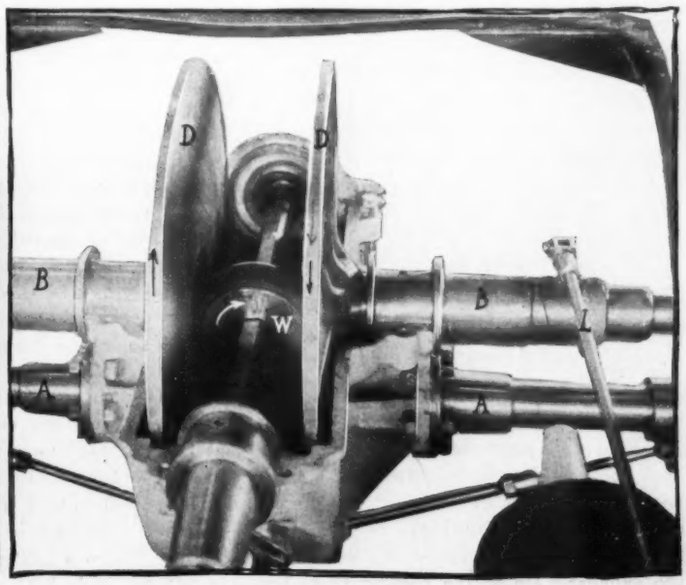


FIG. 6—FRENCH REAR AXLE FRICTION GEARSET

The Readers' Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

DEFENDS CHAIN DRIVE

NEW YORK—Editor Motor Age—In regard to the question of drive, I firmly believe that the chain is by far the better drive for high-powered cars. As to the prediction of the Lozier company, quoted by Mr. Emise in his defense of the shaft drive, it may be remembered that the Lozier company stated in 1907, when a chain-driven car was marketed, that the chain was much the superior of the two forms of drive. Mr. Emise states that most of the cars in the Savannah grand prix race were chain-driven. As a matter of fact there were ten representatives of each form of drive, which makes a fair comparison possible. The first four cars to finish were chain-driven and a chain-driven car made the fastest circuit. A significant fact is that the chain-driven cars have won every international race of the first magnitude since 1906. Mr. Emise, in referring to the question of efficiency, apparently forgets that the universal joints of shaft-driven cars consume just as much power as the sprockets in the chain-driven cars. Mr. Emise states, "a number of manufacturers of high-powered shaft-driven cars have in their entire season's output not experienced a single case of a sagged axle." Does Mr. Emise suppose that motor cars are manufactured to last only a year? I have seen a great many shaft-driven cars with sagging rear axles, but, naturally, most of them were not 1908 models. It is apparent that the chain drive is by far more flexible and easier on tires than the shaft as the torque is absorbed by the chains and not transmitted directly to the tires, as is the case with the shaft drive. With the increasing use of chain cases, the chain drive offers practically all the advantages of the shaft drive, without its obvious disadvantages.—John Jay Ide.

POINTS ABOUT KNIGHT MOTOR

Las Vegas, N. M.—Editor Motor Age—Is the sleeve device in the Silent Knight motor which is used to control the inlet and exhaust ports, absolutely satisfactory? Does it maintain a perfect joint, and how long does it last as a perfect joint? Does Motor Age know of any one who has had this motor in service for 2 or 3 years? Is the original company still manufacturing it, for I do not see it advertised?—A Reader.

The Silent Knight motor is being used abroad on the English Daimler, Panhard, Minerva, and some other cars. Within each cylinder are two reciprocating sleeves between the circular walls of the piston, which sleeves uncover ports to admit the intake mixture and allow the escape of the exhaust. Up to the present there has been no difficulty lubricating these sleeves, which is partly due to the fact that there is commensurate means for distributing the lubricant over them, by means of zigzagged and crossed grooves in the sleeves. The motor is not being manufactured at present in America, the Chicago factory having been closed since the introduction of the motor into England. Continued tests have shown that these sleeves hold the compression and there has been no trouble with warping or deformation of them. On the explosion stroke the inner sleeve is traveling downward with the piston, although at a much slower speed, so that the lubricating problem between this sleeve and the piston is considerably reduced because of this. On the exhaust and compression strokes the piston and inner sleeve are traveling in the opposite direction, but at these times the side thrust of the piston on this sleeve is not so great as on the explosion stroke.

REMEDYING TROUBLES

Philadelphia, Pa.—Editor Motor Age—Please publish these few lines for the benefit of the owner of the Buick car whose motor misses. I would say that after a motor and car have been used about 10,000 miles, the valve guides wear, permitting a leakage of air into cylinders, spoiling the quality of the charge at low motor speed, but only when running idle; it will not miss pulling the car from this cause. Also exhaust valve springs get weak quickly, heat from the cylinders destroying the temper at least at the rate of two sets a year, average car use. The exhaust valve is sucked open at the closed throttle position, pulling back in the cylinder burned gas. This is only noticeable when the throttle is closed; that is, when the motor is throttled running idle. A screw driver forced in a spring and the same kept stretched when the motor is running will quickly prove whether the trouble is due to this cause. Inlet valve cages should be carefully and cleanly seated so as to be sure of no air leak around the back part of valve cage. We always put a piece of abestos wick and shellac around the cage. If coils spark at the platinum very much do not be surprised; look carefully at your commutator, as it is hard to stop it from wobbling, and you will get erratic ignition from this cause. Where a LaCoste type roller timer is put on, it is better to use the ground wire attached to the commutator shaft by a special connection used for this purpose. If the spark which jumps from the plugs wire when it is held from the motor is unsteady and misses when the motor is running, I would say this is a good way to see if the trouble is really ignition. The spark should be about ⅜ inch long.—E. W.

SUBSTITUTING MAGNETO

Chicago—Editor Motor Age—I desire to replace the storage battery on my car with a low-tension magneto, to be used in conjunction with the present coil and timer. I have a four-cylinder Heinze coil and a Herz timer, both 1908 models, and do not care to go to the expense of a complete new outfit. Is it possible to make such a change in my ignition system by simply substituting the magneto for one battery? If so, will Motor Age give an illustration showing how such a system should be wired, in order to use my present coil, timer and switch for both storage battery and magneto?—H. E. W.

It is possible to use a low-tension magneto in place of the storage battery, several magnetos being designed to simply take the place of a storage cell. In a great many cases these magnetos are friction-driven from the flywheel, their speed being anywhere from two to three times that of the crankshaft of the motor, but other concerns gear-drive them. In such cases the wire from the magneto connects at the opposite side of the switch to the wire from the battery, so that you will not have to make any change whatever other than the wire from the magneto to the switch. Magnetos for this work are built by several of the large magneto manufacturers.

TOURING CALIFORNIA

Riverside, Cal.—Editor Motor Age—My experiences in California during the rainy season are not of the pleasantest, and, although touring in this state in good weather is ideal, tourists should not attempt it during the rainy season. Saturday afternoon I arrived at Los Angeles, the weather cleared and for 10 days we had perfect weather. The Saturday it cleared, February 13, we started for Riverside. The road at East Lake park was impassable in places where they were repairing, so we went on up to Pasadena avenue, doing low-gear work for 5 miles, it taking us over 1 hour to make the trip, the car being hub-deep all the time from Los Angeles to Pasadena. From Pasadena we had it better, with occasional nightmares. The Duarte river was a raging torrent with the bridge washed out. I drove into the stream, got half-way across, dropped into a hole and stuck. I got out into the water four times to crank my engine.

Finally I backed up, got a fresh start, dodged the hole and, wet, muddy, bedraggled, but triumphant, I buzzed up on the river bank. My dustpan was battered out of shape and every 3 miles dropped down. Then we took a short cut instead of driving on to Rialto, and had another bad stretch of soft mud. While in the river my engine piled up with muddy water and I drove to Riverside with the feed stream running through the glass a pure adobe gray in color. I had to clean the engine thoroughly. I drove up Rubedoux and over to Redlands. Monday I returned to Los Angeles, finding the roads fairly good, except in two places—one the Duarte river, which we had to ford, and the other the stretch near East Lake park. All the week we covered the country around Los Angeles and Pasadena, driving to Ocean park and Santa Monica twice, the roads being better each succeeding day. Motor cars are most popular in this state, the number per capita population being greater than in any other state in the union, as I understand it. Cars for this section of the country must be good hill-climbers. I believe heavier tires would be a good thing for tourists in California, as they would save blow-outs, with which I have been troubled. Cars for use in this section should have a lower direct gear, making it possible to take not a few of the hills on direct drive.—Tourist.

CARBURETER PREFERRED

Pasadena, Cal.—Editor Motor Age—Through the Readers' Clearing House will Motor Age give the correct spelling of carbureter?—J. M. C. G.

Great differences of opinion exist as to the proper spelling of the word carbureter, and even the highest authorities differ in this respect. The result is that either the "er" or "or" ending is recognized, but only one "t" used.

PROPER TIRE SIZE

Metamora, Ind.—Editor Motor Age—I have contracted for a model 17 Buick, weighing without passenger load 2,900 pounds, and equipped with 32 by 4-inch tires. Will Motor Age state if this size of tire is sufficiently large for the weight, and, if not, state the proper size for such a car?—W. A. Meloy.

According to the tables given out by tire manufacturers, a 32 by 4-inch tire should be capable of carrying a car weighing 2,900 pounds without passenger load. This is the limit, however, set by the tire makers for this weight of machine.

HEAVY CRANKCASE EXPLOSION

Philadelphia, Pa.—Editor Motor Age—Can Motor Age tell me what could cause an explosion in the crankcase of a motor? The same is four-cylinder type with four-cylinder commutator, driven by bevel gear from the inside of the camshaft. This would give the spark inside base. I have noticed small primary sparks around this gear, inside the base when the motor is running with the oil base off. But what would cause the explosion? Where would the gas come from that caused the explosion? The noise was terrific. The crankcase oil bowl was blown off and shattered in thousands of tiny pieces—only a few parts could be found. This happened the first time when the bearings were tightened, the motor turning very stiff. Two quarts of Zeroline oil were put in the crankcase and the motor run idle to free up bearings. After running about 10 minutes—Bingo!—big noise, and about $150 worth of damage. The second time, after the motor was rebuilt, the car was taken out for a slow run of about 10 miles, when alas, the same kind of an explosion took place, and made the road around the car as bright as day. My theory was that the oil was too light and vaporized too easily by the heat of the tightened motor bearings. Just for the sake of experiment, I proved to my own satisfaction it was not a gasoline explosion. I connected a piece of flexible metal tubing to the exhaust pipe at the motor and raced the engine and shut off the switch and discharged the almost pure gas into the crankcase when the motor had slowed up and I was sure the case was filled. I turned on the switch and instantly there was an explosion, but weak, proving that it gets a spark from inside the crankcase to the commutator driving gear, and that it was some other agency besides gasoline gas. Compression on this motor is perfect and the motor did not miss, so it will be seen that the little amounts that might leak past the piston could not do the damage described above. I put on a new motor base and did not disturb the cylinders, pistons or valves, tightened the bearings as usual, making allowance for freeing up after the first run and put another make of oil in the motor. The car has been run about 2,000 miles, and runs perfectly and gives no sign of trouble.

Was it the oil? I know of four other motors that did the same thing, and I advised changing oil and they have been run for almost a year and no trouble has resulted. Certain people said the flame leaked past the piston and ignited the gas in the base caused by leaking past the pistons. This might sound like sense if the motor missed explosions and the compression was poor, as it certainly would have to be poor to do this. The motor tested the other day showed 30 brake horsepower, the same as the original test when new—the same pistons, rings and cylinders. Am I right in my conclusions? Kindly give a theory as to the cause of this accident.—Edw. Wilkie.

To have an explosion you must have an explosive gas and some source of fire or spark to ignite this gas. There must also be a compression of this gas. This could not be gasoline vapor, unless the compression in the cylinders was extremely poor, and that could be noted in the running of the motor. The gas must have been produced from the lubricating oil, and could only have been generated by the tight bearings, but the breather tubes from the crankcase must have been stopped up or otherwise the compression would not have been great enough to have wrecked the crankcase. The whole case is a most unusual one, and Motor Age would like to hear from other readers on this subject, as well as additional information from Mr. Wilkie.

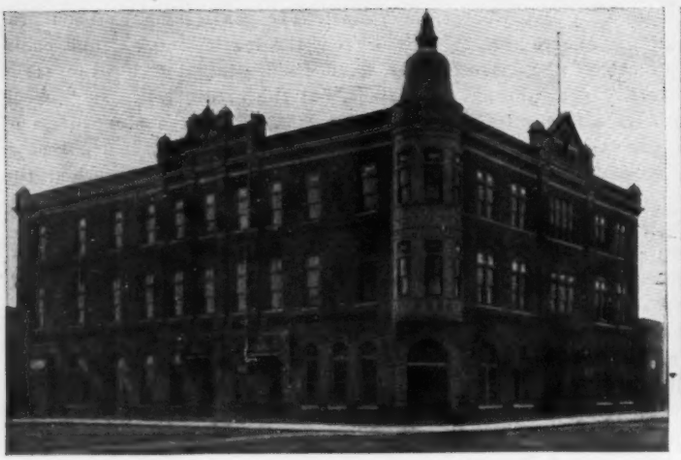
IN TRADE DIRECTORY

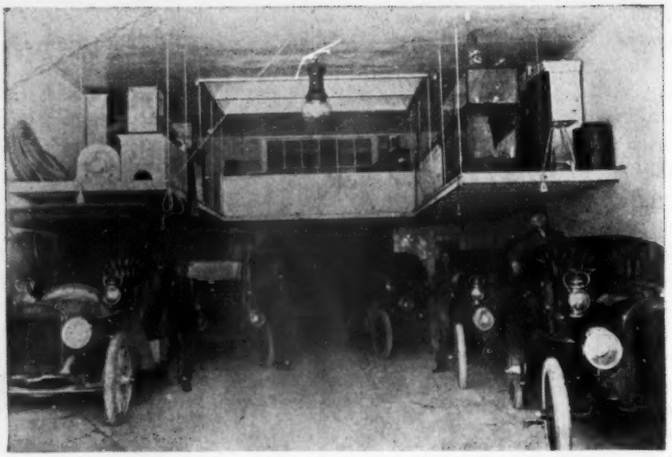
Spicer, Minn.—Editor Motor Age—Will Motor Age kindly send me a book or list giving all the names and addresses of motor car manufacturers in the country, as well as the makers of motor cycles?—H. R. Eine.

The Class Journal Co., 1200 Michigan avenue, Chicago, Ill., publishes the Automobile Trade Directory, which gives the information you desire. This book can be obtained for $1.50 per issue, and contains not only the names and addresses of the manufacturers of all kinds of cars, motor cycles, but the manufacturers of every part in conjunction with motor cars in the country.

COST OF TIRE UPKEEP

Marshall, Minn.—Editor Motor Age—The conditions under which tires are used vary so greatly that any guarantee made by a manufacturer in regard to the number of miles' use which may be expected, is nothing but a crude guess. The actual recorded results of use under specified conditions gives the only true guide to go by in estimating the number of miles the next set of tires will run before lapsing into uselessness. During the year just passed I have been very careful to keep an accurate record of tire wear and tire expense incidental to the use of a doctor's runabout, used on the country roads of southwestern Minnesota. Our road conditions are about as bad as can be tolerated by any one who uses a motor car. The country is rolling prairie, with black dirt surface, and plenty of low sloughs. The roads are but slightly worked, especially in places where they most need it. The reason for this condition is that we have no laws in this state that are adequate to produce good roads, and further to the fact that farmers are permitted to work their road tax at the time and place, when and where it best suits their convenience, instead of for the best interests of the road. This results practically in their putting in their time when ground conditions are such that they can not do farm work, and at such times no part of the road is in condition to permit of being worked, except the high, dry portions, which seldom if ever require any work. The low and naturally bad parts of the roads are, therefore, forever neglected. These low places cut up into deep ruts that, when dry, form





HOTEL AT LEXINGTON, NEB., AND BANCROFT'S GARAGE

the worst possible conditions for tire integrity. The ruts tear away the rubber on the sides of the tires, then quickly destroy the fabric, and a careless run of a mile through such ruts will almost ruin a set of tires. We usually take the rough parts of the roadway to avoid these ruts, but this is not always possible. The principal troubles which we encounter are blowouts, due to rut wear, and rim cutting.

The machine used by me the past year was a Rambler runabout, weighing about 2,000 pounds, fitted with Fisk bolted on tires, 30 by 3½ inches. I made 209 trips of from 2 to 30 miles each, with a total of 1,833 miles. Two tire casings were worn out completely, requiring new ones, and two were retreaded. Four new inner tubes were purchased during the year. There was $8.70 spent for repairs on tires, and $2.40 worth of cement, patches and a sleeve. At the end of the year the tires on the machine were estimated to be worth not over one-fourth the value of new tires. The net tire expense consisted of the first cost of all tires and material, less the value of the tires remaining on hand at the end of the year, as follows:

Four complete new tires, Fisk, 30 by 3½	$165.12
Retreading two casings and express	24.00
Repair material and work	11.10
Four new inner tubes and express	29.20
Two new casings and express	84.06
Total expense	$313.42
Less one-fourth the cost of four new tires	41.28
Net expense for the year	$272.14

The cost per mile for tire wear was 14½ cents, not counting my own time repairing punctures, by inner tube patches put on while on the road. This gives 1,140 miles, as the use to be secured under these conditions of the roads, from one set of Fisk bolted on tires, 30 by 3½, on a car weighing 2,000 pounds. Fisk tires are good tires, but the special nature of them renders replacements inconvenient, and the higher first cost than is charged for the regular type of tires, which, no doubt, is due to their monopoly, makes them more expensive than ordinary clincher tires without any advantage in wear.

Very few tire manufacturers admit that tire expense of an ordinary car is 14½ cents per mile, but the facts of actual use are here given from carefully-kept data, and they cannot be disputed on any possible grounds.

The methods usually used to estimate tire expense for a given time take into consideration only the money paid out for extras, omitting the cost of the set of new tires which were on the wheels at the beginning.

The only uncertain matter is the estimated value of the tires remaining on the wheels at the end of the given time. The road conditions here are much the same as are found all over the praries of the great northwest, and the average length of life of a motor car tire on these country roads will not exceed 1,200 miles. Retreading does not meet the requirements of wear, as the greatest wear is on the sides of the tires, and not on the tread. When once a casing has worn so that a blowout is possible, tire troubles commence that can only be remedied by a new casing, and the sooner it is obtained the fewer inner tubes will be destroyed. Experience has shown me that all efforts to temporarily repair a casing after a blowout result in unending and excessive expense. The tire maker who will faithfully live up to a guarantee of 5,000 miles' use on our country roads will soon quit the business of making motor car tires.—A. D. Hard, M. D.

CORRECTS GLIDDEN ROUTE

Lexington, Neb.—Editor Motor Age—I have just finished reading the story, "Chicago to Denver, a Glidden Suggestion," in Motor Age, issue March 4, which I found very good but not very complete, from Omaha to Denver, and especially from Grand Island, Neb., to North Platte, as the writer has personally driven over this route many times and is familiar with every crook and turn the entire distance, in both wet and dry weather. I have acted as pilot for many cars from Grand Island to North Platte, and to Clumen, Wyo., some of which were the democratic train, and the cars in the New York-Paris race. I notice that Motor Age mentions as stops in Nebraska, Omaha, Grand Island, North Platte, leaving out Lexington entirely, which has the best of hotel and garage accommodations for the tourists. The distance from Grand Island is 90 miles by road, and from Lexington to North Platte 80 miles, making a total of 170. All bridges and crossings are good, or will be at that time. Lexington is not as large as Grand Island or North Platte, but has the most up-to-date garage and machine shop to be found on the route, where nearly everything can be secured, or repairing done. There are 200 motor cars in Lexington and vicinity, the majority of the cars being owned by farmers, who are able to use them the year through. The sale of new machines will be enormous this year and the cars sold will range from $500 to $3,000 and $4,000. I have sold sixteen motor cars since January 1, 1909. I have posted in and around Lexington, for a distance of 28 miles, signboards giving the number of miles and the direction to go, all of which will undoubtedly be of great benefit to the motorists. My garage is 140 by 135 feet, and the tourists will not find between Omaha and Denver any better equipped garage. I shall be glad to give Motor Age, or its readers, any information at any time relative to the roads, garages, hotels, etc. I am getting out a road map in the way of a blue print of the roads between Grand Island, Lexington and North Platte, which I will give gratis to any tourist who stops here. This map will give the exact number of miles to each town, each turn and landmark along the route, covering a distance of 170 miles. If the west can get the Glidden, the best thing that manufacturers of motor cars could do would be to enthuse the people, as there is no end to the number of cars which will eventually come to Nebraska in the next 2 or 3 years. For example: Three years ago the town of Cozad, with a population of but 400 or 500, had but four or five motor cars, and now there are over 100 of them in and around that vicinity, and this also applies to many other small western towns. Lexington has a population of about 3,000; North Platte, 3,600, and Grand Island

8,000, with Lexington in the lead for the number of motor cars by nearly double, at prices ranging from $6,000 to $4,000. In my garage is the Davis-Bournonville Co.'s oxy-acetylene welding apparatus. We want the Glidden tour, and want all tourists to know what they can find in middle Nebraska on the best and only through route from Omaha to the coast.—J. S. Bancroft.

RECENT TRACK RECORDS

Mt. Washington, Md.—Editor Motor Age—I have been a subscriber to Motor Age for over 1 year and have always taken a great deal of interest in track racing. Will Motor Age give me a list of some records and by whom they were made?—Jack Waters.

The recent track meet of the New Orleans Automobile Club resulted in several records being lowered, although these have not been accepted as yet by the American Automobile Association. These include 10 miles in 9:11⅘ and 50 miles in 51:37⅘ by Ralph de Palma in the Fiat Cyclone, and 100 miles in 1:42:39⅘ by Burman in a Buick. At the same meet Mrs. Cuneo in a Knox reduced the woman's mile record to 1:00⅕.

REMEDYING MISS-FIRING

Denison, Ia.—Editor Motor Age.—In the Readers' Clearing House, issue Motor Age March 11, I noticed an inquiry from Andale, Kan., signed "Kansas," asking why his model 10 Buick misses fire on low speed. I have had considerable experience with this model, and I believe his trouble is caused by the spark plugs being located in the side of the cylinders, the oil from the crankcase working up the side of the cylinder wall, getting into the spark plugs which short-circuits them. In answer, I would suggest adjusting the carbureter, retarding the spark clear back, opening the throttle wide, then adjusting the needle valve so as to get the best speed out of the engine. I think this will remedy that difficulty. If "Kansas" will send to the General Accumulator and Battery Co., 134 Second street, Milwaukee, Wis., and get a set of center-fire spark plugs with 1-inch points, he will get his firing points into the cylinder far enough to avoid the oil trouble. Of course, it is almost needless to add, have good batteries.—E. C. Chamberlin.

CAR FOR SANDY COUNTRY

Lebanon, Pa.—Editor Motor Age—In Motor Age, March 11 issue, I read an inquiry which I am prompted to answer through these interesting pages. The inquiry came from Mesilla Park, N. M., relative to the kind of car for use in that sandy section of the country. For the information of the inquirer I would say that I am the owner of a model G, 1908 Franklin, a light and flexible car, just the car for use on sandy roads and where a frequent change of gear is necessary. The Franklin is air-cooled and has a multiple-disk

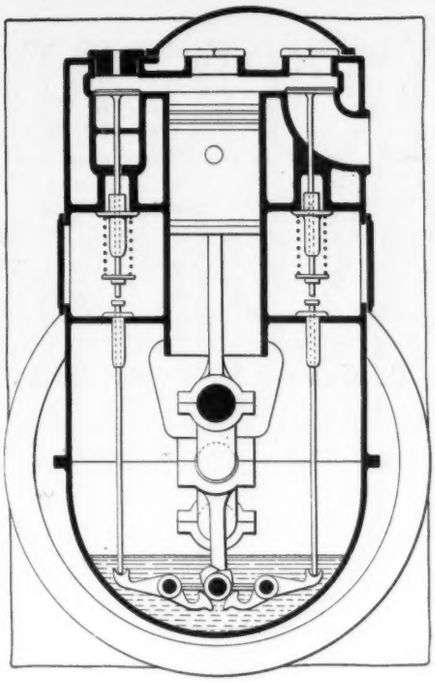


FIG. 1

clutch, and if put in second gear will run up very stiff grades and through any sand for miles without change, and if change becomes necessary it is very easily done. I have driven my car through miles of sand on high, and if I desired to change all I have to do is to push out the clutch and pull the speed lever back and let the clutch slip in place, which operation is very easily accomplished. In regard to the poise of the engine, in front or middle of car, I think the car runs more steadily with the engine in front; the passengers will make up for balance of weight. I prefer the engine in front and a four-cylinder to a two-cylinder car.—John H. Cilley.

OPINION ON MOTOR DESIGN

Webster Groves, Mo.—Editor Motor Age—As a reader of Motor Age, I take the liberty to ask for some information. The motor in question is a four-cylinder, four-cycle with cylinders cast en bloc, the principal feature of which is the single camshaft operated under the crankshaft in the crankcase. The motor is of the T-head type, valves being operated by tappet rods from rocker arms in the crankcase. Thermo-syphon system is employed. The camshaft and rocker arms operate in oil at all times. Will Motor Age inform me if the design is a new one, and why it has not been adopted? What are the advantages and disadvantages of the motor, which is illustrated in Fig. 1. Some of its leading features would be—single camshaft with all parts running in oil, and, being supported by crankshaft bearing cap, is independent of lower half of crankcase. This method permits of inspection of the camshaft and crankshaft without taking down the motor; the cylinders are cast en bloc and fastened to the crankcase at the lower line of the waterjacket; the crankcase incloses the valve springs and tappet rods, making an oil-tight motor, as well as one free from grit and noise, and very rigid. Inspection holes in crankcase opposite valve springs make these parts readily accessible.—G. F. H.

The design is a new one and so located the camshaft is very inaccessible. Could it be so designed that the camshaft could be pulled out endwise through an opening in the end of the crankcase, so that the base of the crankcase would not have to be removed, it would be most valuable. The design is a new one but the extra number of pieces required would not recommend it over two camshafts, one in each side of the crankcase. It would interfere very badly with the splash system of lubrication in the motor, and would call for a particularly deep crankcase. The support on the crankshaft bearing caps is not good.

FORMULA FOR SOAP

Iola, Kan.—Editor Motor Age—Will Motor Age publish a formula for caustic potash linseed oil soap for washing motor car bodies?—P. S. Mitchell.

The following is a formula taken from the United States pharmacopoeia: Linseed oil, 400 grammes; potassium hydroxide—caustic potash, 95 grammes; alcohol, 40 cubic centimeters; water, 450 cubic centimeters.

MAIN STREET, LEXINGTON, NEB.

The SELECTION of a RADIATOR

By Joseph E. Lewis, M. E.

Part II

MANUFACTURERS of motor car radiators have devoted far too little time to the making of scientific tests in order to determine the best proportions and the best arrangement of parts to produce the highest radiating efficiency. This has resulted largely from the fact that the demand for radiators has been so great every energy has been bent to the problem of supplying it, leaving such refinements as laboratory tests for a more convenient season. More attention is being paid to this important subject at the present time, however, than formerly; although a full realization of the importance of making such tests has perhaps only come when competitors have encroached upon the trade offering more efficient radiators.

Maximum Radiation Needed

As competition becomes keener the necessity of getting the maximum amount of radiation out of every pound of metal used has become imperative. This cannot be done successfully by guesswork, neither will experience and good judgment always serve to secure the best results. The only sure way is to conduct a series of more or less elaborate tests. Who can say offhand what is the proper size of air cell in the honeycomb type of radiator, or what the best thickness of water space, or where is there any available data relative to the proper size, arrangement and spacing of the tubes and fins in the tube and fin type of radiator? And yet all of these things have a direct and measurable influence upon the efficiency of the radiator. It is the purpose of this article to describe a simple form of apparatus and the methods of testing which have been employed by the writer recently with very interesting and instructive results.

Apparatus Is Illustrated

The accompanying Figs. 2 and 3 show the apparatus in plan and in elevation. It is mounted upon a very substantial table made of 2½-inch yellow pine planks, and heavy enough to be free from excessive vibration. The water is circulated continuously through a small heater, A, which consists of a spiral coil of ¾-inch seamless copper tube within a small cylindrical cast iron shell, with cast iron covers bolted on top and bottom. The shell is 9½ inches in diameter and 21 inches high. The coil consists of eleven convolutions, 7½-inch outside diameter, giving a total of 19 lineal feet and about 5 square feet of effective heating surface. This heater has proved to be of ample capacity to operate satisfactorily in connection with radiators having from 65 to 100 square feet of radiating surface. It is a stock pattern of feed water heater of 20 horsepower rated capacity.

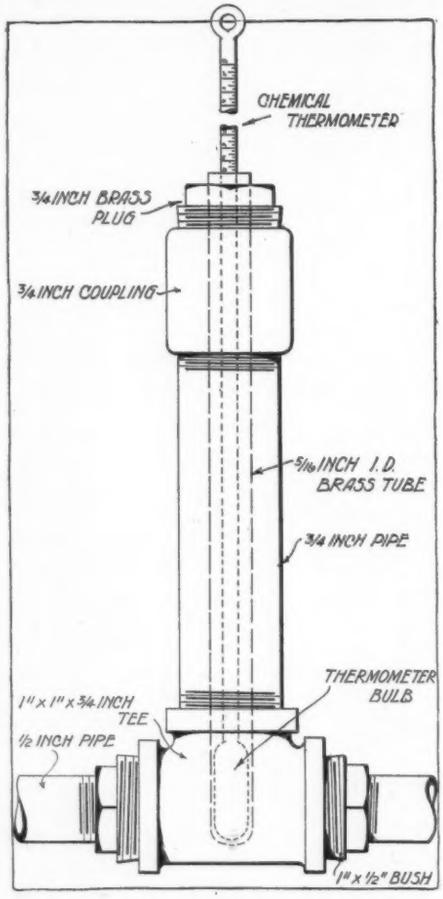


FIG. 1—THERMOMETER CUP

The water is carried in the shell of the heater, under only as much pressure as results from its own hydrostatic head. Steam is used as the heating agent and is admitted to the coil under pressure, the coil being strong enough for any ordinary steam pressure which might be used. In our tests steam was used from the boiler at 80 pounds pressure, throttled at the inlet, however, so that probably the actual pressure in the coil was at no time very much above atmospheric. The supply of steam is regulated by hand by means of the globe valve shown in the steam inlet pipe, B. It is possible to regulate the supply so accurately in this way as to produce any desired temperature in the water passing from the heater to the cooler, and to maintain this temperature constant during the test of 30 minutes to 1 hour's duration, without more than one or two degrees of variation. The temperatures of inlet water employed ranged from 170 degrees to 190 degrees Fahrenheit, according to conditions which will be mentioned later.

A drain pipe, C, connected to the lower end of the coil, carried the condensed steam to the trap, E, whence it is discharged into the sewer. A pipe, F, fitted with a shut-off valve as shown, is connected to the top of the heater shell, for admitting water. All connections are made with ½-inch iron pipe or with ¾-inch rubber hose.

Testing a Radiator

The radiator to be tested is shown at G, mounted upon the front of the table, and connected to the top of the heater by means of the pipe, H, at an intermediate point in which is introduced a thermometer cup, I. The bottom of the radiator is connected to the bottom of the heater by means of the pipe, J. At intermediate points in this pipe there are placed a strainer, K, to protect the pump; a thermometer cup, L, and a No. 8 Brown & Sharpe gear pump, M. The pipe, J, is extended to the right by means of the branch, N, which connects with the sewer and is provided with a valve, thus furnishing a drain for the system when it is necessary to remove the water before changing coolers. At the other end of the pipe, J, is an extension, O, provided with a valve and used in weighing the water as described later.

The two thermometer cups are located so that the temperature of the water may be taken just before entering the radiator at the top and again just after leaving it at the bottom, thus measuring the drop in temperature produced by the cooler. A detail of these cups is shown by the accompanying Fig. 1. A piece of $\frac{5}{16}$-inch inside diameter brass tubing, closed at the bottom end and open at the top, passes through the ¾-inch pipe plug, as shown, and is soldered into it, thus forming a pocket into which the thermometer fits closely. A bit of

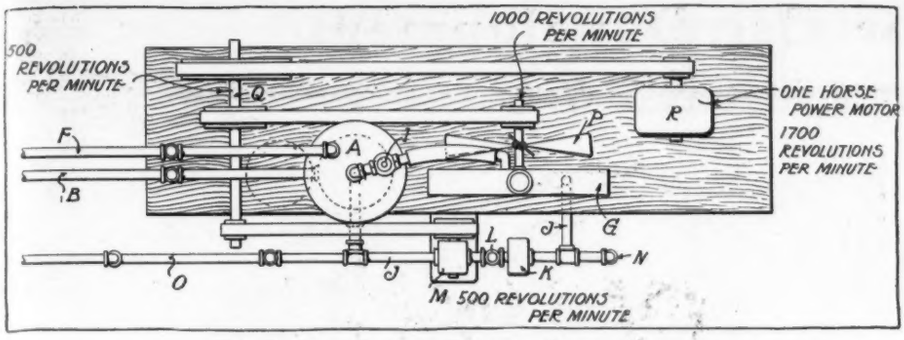

1000 REVOLUTIONS PER MINUTE
500 REVOLUTIONS PER MINUTE
ONE HORSE POWER MOTOR
1700 REVOLUTIONS PER MINUTE
M 500 REVOLUTIONS PER MINUTE

FIG. 2—PLAN VIEW OF RADIATOR TESTING PLANT

waste placed in the bottom of the tube will protect the bulb of the thermometer from coming into direct contact with the metal, thus avoiding danger of breaking it. The tube is filled with oil, and the stem of the thermometer is inserted so that the bulb is directly in the path of the current of water. Care must be taken in regard to this, for if the bulb is too high up and out of the direct flow of water the thermometer will read too low, and will not register the real temperature of the water. The results of the test in such a case would be misleading.

Chemical thermometers about 12 inches or 14 inches long should be used, having the scale etched upon the glass stem, and the scale should read only from 32 degrees Fahrenheit to 220 degrees Fahrenheit, so as to give a wide graduation, making it possible to read one-half degrees accurately, or even one-fourth degrees. The two thermometers should be compared at different temperatures by holding them in hot water side by side in order to see that they read the same at different points in the scale.

Removing the Strainer

The strainer, K, should be made and connected in such a way as to be easily removed and cleaned. It was found to be an essential feature of the apparatus, since a small particle of solder out of a radiator will not pass through the gears of the pump, but will wedge into and stop them, spoiling the test and making it necessary to shut down and remove the obstruction.

A gear pump was employed because it is positive in its action, throwing a definite quantity of water for a given speed, so that the amount of water circulated per minute could be regulated accurately by regulating the number of revolutions of the pump. The centrifugal type of pump cannot be depended upon in this respect.

A convenient size of radiator to test, and one which was employed in most of the work, is 24 inches wide, 22 inches high and 3 inches thick. Back of the radiator is mounted an 18-inch diameter, six-bladed aluminum fan shown at P. It is mounted upon ball bearings entirely independent of the cooler, and is belted to the jackshaft, Q, by means of a 1¼-inch flat belt. The shaft, Q, is driven by means of a 2-inch belt from a 1-horsepower General Electric three-phase induction motor, R. The motor speed is 1,700 revolutions per minute, and the shaft is driven at about 500 revolutions per minute. The pump and the fan are both belted to the shaft, Q, and idle pulleys held in position by weights are employed to produce the same tension on the belts at all times, so that conditions as regards fan and pump speeds will not vary in different tests. The shaft, Q, might be driven from the mainshaft overhead in the shop, but the use of an independent motor is far more convenient, as it enables one to run tests at any time of day or night regardless of shop conditions.

Tests Must Be Uniform

In order to obtain reliable results the conditions for a series of tests must be as nearly uniform as possible. The following conditions were maintained during most of our tests: Speed of fan, 1,000 revolutions per minute; speed of pump, 300 revolutions per minute; temperature of circulating water at inlet of cooler, 100 degrees hotter than temperature of air in the room. The air temperature was taken 6 inches in front of the radiator.

All radiators tested had the same front area of radiating section, which was about 360 square inches. The whole area was nearly covered by the fan. Radiators of different thicknesses were tested, varying from 2 inches up to 4 inches in order to determine the effect of thickness upon capacity, but aside from this difference in thickness the dimensions of all radiators tested were the same. The pump running at 300 revolutions per minute delivers about 46 pounds of water per minute, and since the speed of the pump is always the same, the amount of water per minute passing through each radiator under test is exactly the same. The amount of water being the same in all cases, the drop in temperature between the inlet and the outlet of the radiator is an accurate measure of the quantity of heat radiated. If we multiply the number of pounds of water per minute, say 46, by the drop in temperature in degrees Fahrenheit, say 20, we have the total heat radiated per minute, namely, 920 British thermal units. It will be readily seen that the most efficient radiator will produce the greatest drop in temperature and also that the relative efficiencies of several radiators tested under the same conditions are directly proportional to the drops in temperature produced by each. A radiator producing a drop of 15 degrees is only 75 per cent as efficient as one which produces a drop of 20 degrees.

Measuring Pump Capacity

The capacity of the pump was measured and verified before and after each series of tests by weighing the water discharged in a given time. For this purpose the extention pipe, O, on the left was used. A barrel mounted upon scales was placed so that this pipe would discharge into it, and the valves were then manipulated so as to admit water through the pipe, F, to the heater, from which it passed to the radiator, where it was held at a constant level. From the radiator the water passed through pipes J and O into the barrel, the pump running the same as during a regular test. The barrel was arranged with a large discharge pipe at the bottom so that it would empty faster than the water ran in at the top. This discharge valve could be closed quickly, allowing the barrel to partially fill while the weights were manipulated and the time recorded by means of 1-minute readings. The discharge valve could then be opened, emptying the barrel and a second set of readings taken in order to check the first.

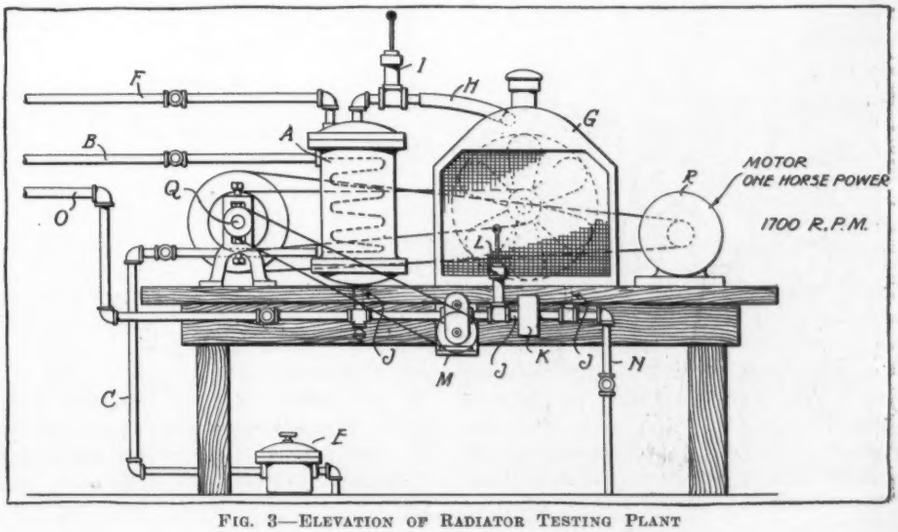


FIG. 3—ELEVATION OF RADIATOR TESTING PLANT

Motor Car Development

THERE are two Midland models for this season, a large car, model G, the small one, model E. Both are of the four-cylinder type with cylinders in pairs, employ magneto ignition, three-disk clutches, selective gearsets, shaft-drive, with elliptic springs in rear and double thermoid brakes. Although the cars are alike in general design, they differ in lubricating methods and other ways. Most conspicuous in both models is the spring coupling interposed in the driveshaft between the disk clutch and gearset, and designed to relieve the gears and back axle of sudden strains that might be caused owing to quick engagement of the clutch, and in turn, relieving the engine of strains occasioned by too quick braking. This spring coupling is, in brief, a yoke or pair of jaws carried on the clutch sleeve, and on the forward end of the gearboxshaft is a corresponding yoke arranged at right angles to the former. Between the ends of these yokes are two coil springs which absorb the jar.

Motor of Conventional Design

The Midland motor is a conventional design with two-part crankcase, twin cylinder castings with valves on the left, enclosed half-time gears at the forward end, and four-point suspension on a sub-frame. A leading novelty in this motor is the lubricating system contained within the crankcase and which was described in detail on page 41 Motor Age February 4. This system, in brief, consists of an oil reservoir R, Fig. 1, incorporated with the lower half of the crankcase and located beneath one-half of it. The crankcase proper is divided into four compartments, one for each of the connecting rods. In the forward end of the case is a plunger pump, the plunger reciprocated by an eccentric on the camshaft and a spring. This pump delivers the oil through pipes contained in the crankcase to the four compartments. Each compartment has an overflow pipe into the oil reservoir. This system is thus a typical splash one with circulating system supplying the splash. On the bottoms of the pistons are the usual oil grooves, which aid in lubricating the cylinders. On the model E, the small car, a crankcase-contained oiling system is not employed, but a mechanical oiler with sight feeds on the dash is used instead.

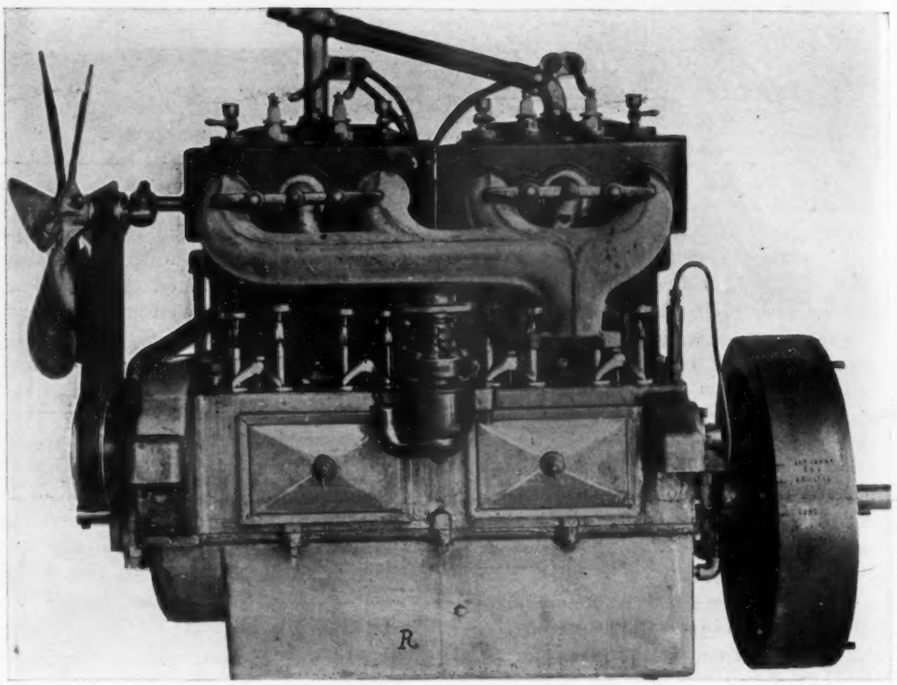


FIG. 1—MIDLAND MODEL G MOTOR HAS CRANKCASE LUBRICATOR

Compact in conjunction with the cooling system is locating the water pump P, Fig. 2, on the forward end of the magnetoshaft and also not to be overlooked is the eccentric adjustment E of the leather belt driving the fan. A tubular radiator is used on both models.

Dual Ignition System Used

A dual ignition system is fitted, consisting of the Remy inductor type magneto with non-vibrator coil on the dash, and a set of dry cells wired to the non-vibrating coil, so that when the dry cells are used the current is distributed through the magneto distributor to the plugs. The magneto is particularly accessibly located on the right side on an integral bed plate, where it is entirely free from hot exhaust pipes and where the high-tension wires are carried clear of all metal parts. The magneto

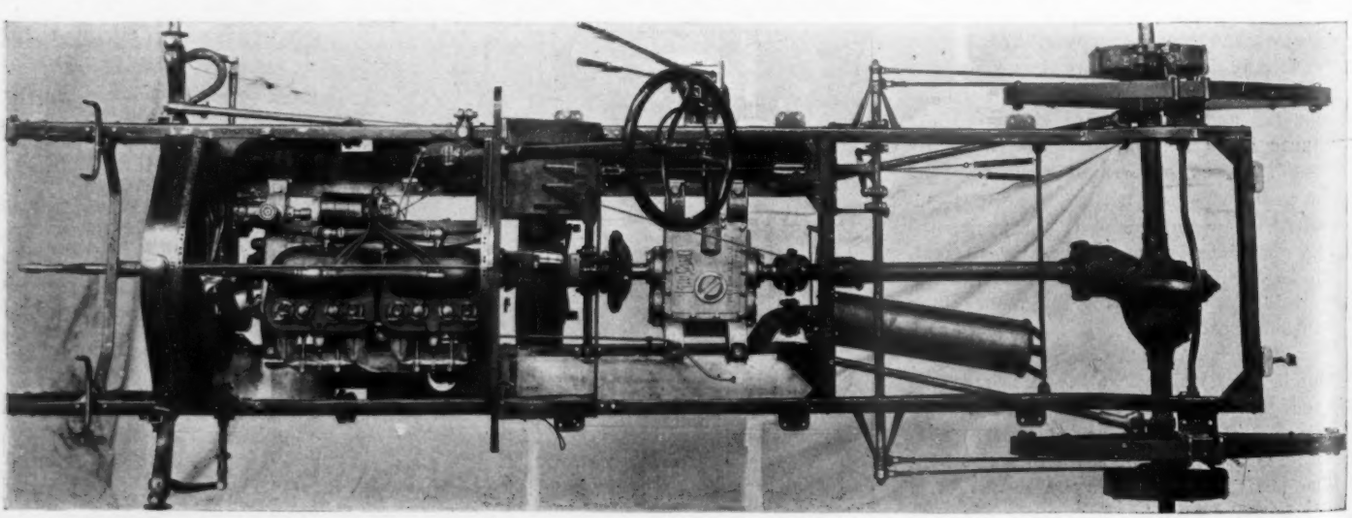


FIG. 3—CHASSIS OF MIDLAND SHOWING SPRING DRIVE IN SHAFT IN FRONT OF GEARSET

Midland Cars in Two Types

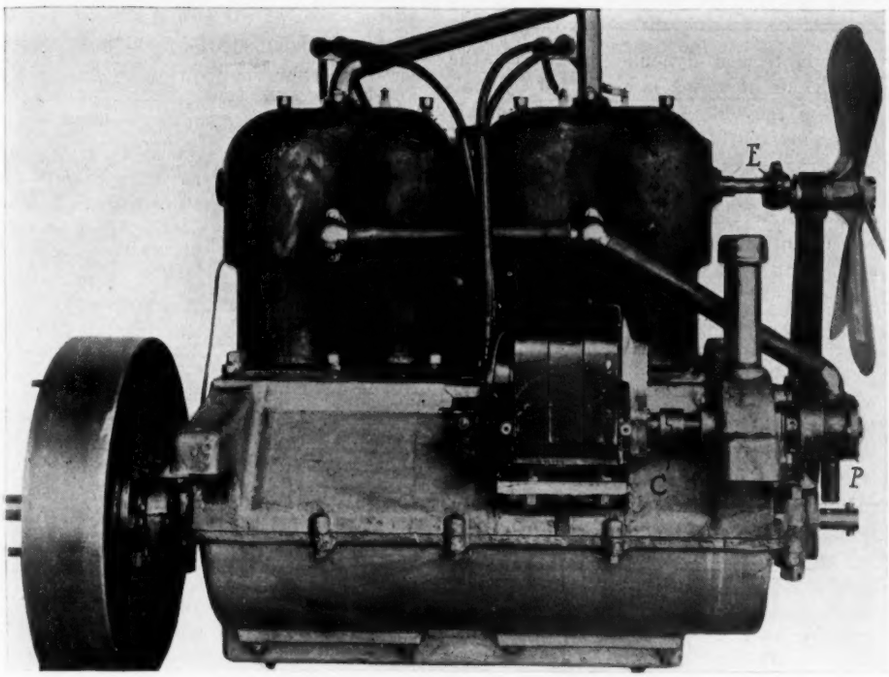


FIG. 2—MAGNETO AND PUMP SIDE OF MIDLAND MOTOR

has the usual clutch coupling C with its driveshaft.

The workmanship in conjunction with the motor is standard, and not to be overlooked is the offsetting of the crankshaft ¾ inch from the cylinder center in order that, on the explosion stroke, there will be less angularity of the connecting rods; whereas, on the exhaust and compression strokes its angularity is increased.

In both models is used a three-disk clutch. The central disk made of phosphor bronze is fitted with cork inserts and carried on the flywheel. On each side of it is a steel disk so that in engagement a coil spring clamps the bronze disk between the steel disks. This clutch is interconnected with the internal or foot brakes.

The selective gearset, graphically illustrated in Fig. 4, has its three forward and one reverse speeds controlled by the lever L, which does not work in an H, but rather a gate quadrant. As illustrated, the reverse is engaged, the transfer of power being from gear 1 to 2 on the countershaft, thence from gear 3 through an idler to 4 on the mainshaft, and to the rear axle. Were gear 4 moved forward into mesh with 5 on the countershaft, slow speed ahead would be in. Moving gear 6 forward so that its face teeth engages those on gear 1, would give direct drive, when the short shaft would be coupled direct with the mainshaft. Moving gear 6 backward to mesh with gear 7 would give intermediate forward speed.

So comprehensive is this illustration that it shows how the two sliding gears 4 and 6 are shifted, which is as follows: With the lever L occupying the gate G, all gears are neutral. Pushing the lever L toward the gearbox engages it with the short lever L1, which is secured to the outer end of the sleeve M, which sleeve carries on its inner within the gearbox a depending arm M1. This arm has an inverted T, lower end, which engages with the shifter rod R, and the forward end of this rod R is a yoke which rests in a collar on the sleeve on the gear 4. Moving the lever L1 back to opposite G would mesh gears 4 and 5, giving slow speed ahead. In a similar way the lever L may be engaged with the short arm L2 by pushing it outward from neutral. This short arm attaches to the outer end of the rod N which is within the sleeve M, and this rod has its inner end, or drop arm, which connects with the sliding rod W which is provided with an arm connecting with the gear 6, as illustrated.

A novel interlocking device is incorporated which consists of an arm J and another one J1, the former carried on the lever L2, the latter on the lever L1. Its action is illustrated. Just so soon as the lever L moved out of the gate G after having taken up the lever L1, a spring forced the interlocker J into the gate, making it impossible to move the lever L2 one way or another, thereby locking the gear 6 against accidentally being pushed into direct or intermediate drive. Similarly, should the lever J be moved out from the gate taking up the lever L2, the arm J would be forced by spring into the gate G, thereby locking the lever L1.

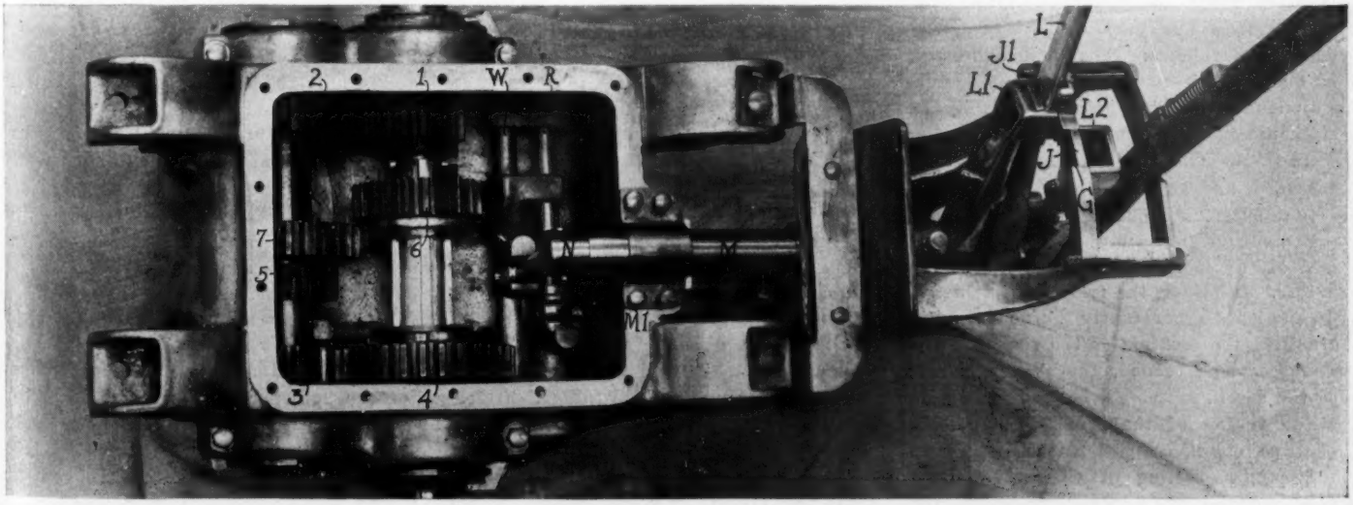


FIG. 4—THREE-SPEED SELECTIVE GEARSET EMPLOYED ON BOTH MIDLAND MODELS

IGNITION AS IT CONCERNS MOTOR INDUSTRY

EDITOR'S NOTE—The following paper on ignition was read by J. A. Williams, president of the K-W Ignition Company, of Cleveland, O., before the National Gas & Gasoline Engine Trades Association, at Chicago, February 9.

IT is an indisputable fact that the gas and gasoline engine of today, as far as the engine itself is concerned, is practically perfect; and is not susceptible of any further great improvement. There remains, however, two very important functions of the gasoline engine which have not been developed up to a stage as perfect as is the engine, and which when developed to that stage will make the internal combustion engine not only the most economical, from a technical and commercial standpoint, but the most reliable source of power extant.

The two functions to which I refer are that of ignition and carburation. I have chosen ignition for my subject, not that I consider it of any greater importance than that of carburation, for they are both equally important to the successful operation of the engine, but inasmuch as I have devoted several years past to the subject of ignition, and have made of it a thorough study, I feel at the present time more competent to discuss that subject with you than that of carburation.

First Type of Ignition

The first type of ignition which achieved any commercial success was the old hot-tube, which has almost, if not entirely, been superseded by electric ignition, either of the make-and-break spark type or of jump spark. The make-and-break type of ignition is more commonly used on larger and slower running stationary engines, while jump spark is more applicable to smaller-powered, higher-velocity engines. The reason for this is that the proper mechanical circuit-breaking mechanism to operate the igniter points for make-and-break ignition is extremely difficult to make of sufficiently small size and light weight as to render it positive in its action at very high speeds. The jump spark system of ignition is capable of being successfully operated at very high speeds, as the problems in it are more of an electrical than a mechanical nature. In other words, the difference between the two systems has very often been aptly defined as follows: The make-and-break is complicated mechanically but simple electrically, and the jump spark is simple mechanically but complicated electrically.

As to the virtue of either system, both are good, and as far as I have ever been able to ascertain, equally so, provided that the appartus and mechanism employed are of a substantial and satisfactory nature. In either, the two most important factors to be constantly borne in mind are, first, the creation of the spark that is intensely hot; second, the proper timing of the spark.

The timing of the spark in a gas or gasoline engine is just as important as the proper setting of the valves in a steam engine. In make-and-break the spark which is created is composed of what is termed dynamic electricity, the heat value of which is estimated by multiplying the voltage across the terminals of the arc spark by the volume or amperes of current flowing through the spark. The product is the heat units expressed in watts. Now this same law applies to the estimation of the heat units of the jump spark, provided that the jump spark is composed of dynamic instead of static electricity. A great many sparks that are used in jump spark work are static instead of dynamic. The static spark looks white and makes a snappy sound, but will only indifferently ignite the charge in the engine, whereas a jump spark that is composed of dynamic electricity, has a reddish appearance, does not have a snappy sound and is intensely hot.

The spark coils that produce either a dynamic jump spark or a static jump spark, look just alike, but the defects in a spark coil which make it produce a static spark are, first, that its windings are improperly proportioned to each other, and to its condenser capacity; second, through dampness in the paper insulation of the coil producing a leakage from turn to turn and from layer to layer which forms a partial internal short circuit in the secondary winding of the coil, the result of which, to a large extent, neutralizes the self-inductance of the primary winding, consequently permitting the condenser discharge to oscillate at enormous frequencies through the primary winding. The result of this enormous frequency passing through the primary winding sets up a static current of high voltage and high frequency in the secondary winding. A properly designed and constructed spark coil should simply act as a transformer which will transform low-voltage dynamic current into high-voltage dynamic current, but where there are faults in the design or construction of the spark coil, which permit high frequencies to come into play, the spark coil delivers from its secondary winding, static instead of dynamic current.

Seeks Pure Dynamic Current

In the design and construction of the spark coil, the object should be to keep down the frequency of oscillation to just as low a point as possible, so as to get just as pure a dynamic current out of the secondary as possible. A static spark is composed almost entirely of high frequency, high voltage, with no appreciable amperage or volume, consequently it has not sufficient heat units to properly explode the mixture in a gas engine. There is no doubt in my mind but that the majority of jump spark coils in use today are not delivering pure dynamic sparks, but largely static sparks. This feature calls to mind the much discussed question as to which of the two sparks, make-and-break, or jump spark, give to an engine the more power. Some have said make-and-break and some jump spark. No doubt when a good make-and-break spark is compared with a poor or static jump spark, the evidence is all in favor of the make-and-break, but in reality if a good, hot, dynamic current jump spark is compared with the same character of current in a make-and-break spark there will be found no difference in the power developed by the engine with either of the two systems of ignition.

Not Dependent On System

The power given to the engine, therefore, does not depend upon what system of electric ignition it has, but does depend entirely upon whether dynamic or static current is used in the spark. In make-and-break ignition there is no way to make a static spark, consequently all of the sparks are dynamic, but on jump spark ignition with poor quality and cheaply constructed spark coils, the majority of the sparks in use are to a very large extent static, and consequently very low in heat units. The timing of the spark should be so arranged with reference to the position of the piston or crank that the engine will receive the full force of the explosion at exactly its dead center position or immediately thereafter, as in this position the mixture is at its highest point of compression and occupies the smallest space. The spark, however, should occur in the cylinder slightly before the dead center position, the amount in advance of the dead center position depending first upon the character of the mixture, its homogeneity and chemical composition; secondly, upon the heat of the spark. For instance, take a mixture that is either of an improper proportion or is poorly mixed, and it will require more spark advance than a mixture of proper proportions, that is homogeneous and well-mixed, or a weak spark will require considerably more spark advance to light any mixture than will a hot spark. This lighting of the mixture in advance of the dead center position creates a false compression and a back pressure against the forward direction of the engine, and therefore causes a considerable loss of power in the engine.

This is one reason why a real hot spark gives to an engine more power than a weak spark, and is the principal reason, for the hot spark does not start combustion of the charge until the compression stroke is very nearly or entirely completed and it propagates ignition through the charge much more rapidly, which has the effect of burning all the gas, thus creating

complete combustion when the gas is compressed in its smallest volume, consequently raising it to a higher temperature, giving a greater thrust to the piston of the engine, and maintaining its thrust at greater pressure throughout the entire power stroke.

In multiple-cylinder gas engines the timing of the spark of the different cylinders must be exact. In other words, there must be synchronism or equal time between the occurrence of the spark in the different cylinders. In further explanation, the spark must occur at exactly the same point on the crankshaft circle for every cylinder.

Three-Cylinder As Example

Let us take for example a three-cylinder engine. Should the explosion occur at exact dead center in cylinder No. 1, 20 degrees before dead center in No. 2 and 20 degrees after dead center in No. 3 you would have only one cylinder giving its full quota of power, namely, cylinder No. 1. Cylinder No. 2 would spend part of its power trying to reverse the engine, while cylinder No. 3 would fall 20 degrees short of giving a full power stroke. The above example is by no means an uncommon condition, but it seems to be the common rule rather than an exception.

With make-and-break ignition on multiple-cylinder engines, it is rather hard to maintain exact synchronism, owing to the wearing of the igniter points and circuit-breaking mechanism. With jump spark ignition where the timer segments are equally spaced and where a master vibrator is employed to break the circuit for all the coils which spark all of the cylinders, no such difficulty is encountered, but exact synchronism is established and maintained all of the time between all of the cylinders. Where a master vibrator is not employed, it is a difficult matter to adjust the vibrators of the different coils so as to get exact synchronism.

Auto-Synchronous Coil Winding

It is possible, however, to build spark coils which will synchronize without a master vibrator; in other words, coils which are auto-synchronous, no matter how their vibrators are adjusted. An auto-synchronous coil should be wound so as to have a very quick time constant. The vibrator springs should be so proportioned that increased tension on the vibrator spring brings into action a correspondingly increased amount of magnetic attraction to the vibrator tongue or armature, the one exactly offsetting the other, with either an increasing or a decreasing vibrator tension.

There are two sources of electric current for ignition. One is the magneto, which generates a current by mechanical means, the other is a battery either dry, wet or storage, which generates current by chemical means. There are three types of magneto ignition. The most recent type is the inductor type of magneto, which has no moving wires, commutators or brushes, and which generates a sine wave of alternating current. The second type is a dynamo type of magneto, which has a commutator and brushes, and a little drum wound armature, and which has a permanent magnetic field. This type of magneto is merely a dynamo with permanent magnets instead of electro magnets for its field. The third type of magneto, and one which will not be described in this paper, is an alternating current magneto, which is equipped with its own circuit-breaker and distributer, and which is commonly called a high-tension magneto. This type of magneto is also often made with a circuit-breaker and distributer and a primary winding on it, which operates on a coil, external to the magneto. It is a low-tension magneto, but is also frequently called a high-tension magneto, on account of its producing jump spark.

Advantages of Systems

In this article we will refer to magneto ignition as used on the make-and-break system of ignition, and on the jump spark system of ignition where a timer and vibrating spark coil are used. The magneto system is of course more expensive in first cost, but if a properly designed and constructed magneto is used, there is no appreciable maintenance charge on the ignition system. If batteries are used, while the first cost of the installation is lower, the maintenance charge begins with the starting up of the engine and never stops as long as the engine is in use.

On make-and-break ignition there is a very decided reason for using magneto ignition over battery ignition, for with a properly designed and constructed magneto, the igniter points in the cylinder of the engine last indefinitely, and they can be made of very cheap material, such as steel, or German silver, for the voltage which the magneto delivers is sufficiently high to overcome any ordinary resistance, such as oxidized or dirty points, whereas, the ordinary battery which only delivers from 4 to 6 volts for make-and-break ignition, requires clean contact points, and of a metal which will not oxidize, for if the resistance of the points is too high there is not sufficient voltage in the battery to charge the coil. The dynamo type of magneto which has a commutator and brushes and governor and which operates through means of the ordinary kick coil just as batteries do, is no better in this respect than batteries. The proper type of magneto to use for make-and-break ignition, is the inductor type, which requires no coil of any kind, as the winding on the magneto itself acts as a kick coil, so that when the circuit is broken the voltage across the igniter points will range very close to 700 volts, more or less, according to winding of the magneto, and its speed, although the amperage or volume of current will be comparatively small. With battery or ordinary dynamo type magneto, the first voltage, that is, that used in charging the primary or kick coil, is necessarily extremely low, from 4 to 6 volts, and the voltage across the points when they break, is about 60 volts. Now assuming that both sparks have the same amount of energy, the one from battery or dynamo type of magneto would have ten times the current and ten times the destructive effect upon the igniter points of the engine, than would the inductor type of magneto. It is not voltage that burns out points, but it is the amperage or volume of current.

The inductor-type magneto, with which I am most familiar, has a primary or first voltage of about 70 volts, which is ample to go through any set of igniter points, no matter how burned, pitted or oxidized they may be, and as this is multiplied about ten times by the breaking apart of the igniter points, there are about 700 volts with a consequently small amount of amperage thrown across the igniter points as they separate. An additional advantage of the inductor type of magneto over the dynamo type for make-and-break ignition is that the inductor type can be positively gear-driven at crankshaft speed for engines of one, two and four cylinders, and at one and one-half times crankshaft speed, for engines of three and six cylinders. The inductor type has the further advantage of passing current through the igniter points in a very much smaller interval of time than a battery or dynamo type of magneto can charge a primary coil, therefore the circuit-breaking mechanism on the engine can be so constructed as to close the circuit for a very small interval of time, thereby taking up a lot of the lag in the circuit-breaking mechanism.

Use of Primary Coil

When using a primary or kick coil with battery or dynamo type magneto, it takes such a long time for the primary coil to become charged with current that the circuit-breaking mechanism on the engine has to keep the contact points together for a considerable period of time in order to charge the coil, and then when the tripping mechanism operates the circuit, the breaker has to swing through a long arc of its travel before it breaks the contacts apart, thus causing a considerable lag to the circuit-breaker. The inductor type magneto permits of the use of a circuit-breaker for make-and-break spark which will operate the engine at engine speeds fully as high as any jump spark system could operate under. There are quite a few motor car and motor boat engines in use that employ the inductor type of magneto and a specially made, rapidly-acting circuit-breaker mechanism, and they get just as good results from make-and-break ignition as could be obtained from jump spark ignition.

Speaking of jump spark ignition, the

most important factor in the apparatus is the spark coil. The spark coil looks like a very simple piece of apparatus, but there is enough electrical science employed in the construction of a first-class spark coil to fill volumes in describing it. All that we can say about it here is that it must be so designed and built as to produce a dynamic instead of a static spark. It must have a very quick time constant, permitting it to operate on timers of very short segments, thus economizing battery current. Furthermore, it should have a vibrator constructed with reference to the time constant of the coil and so constructed that a careless user could not possibly adjust the vibrators so as to make the coil take more current than its insulation would withstand.

Avoid Soft Platinum Points

Soft platinum points should not be used, but an alloy of such a percentage of iridium and platinum as will permit a very hard and dense point and one which will not weld itself together as soon as it warms up. It must be borne in mind that pure platinum is a very soft and spongy metal, and will weld together at temperatures extremely low for welding heat. Iridio platinum contact points require a very much higher temperature before they will weld or seize together.

In the construction of spark coils the very best of insulating material should be employed, and after the windings are made, they should be pumped out in a hot vacuum, thus exhausting all of the air and moisture, and they should then be impregnated while under vacuum with a dielectric of heat and moisture-resisting qualities, which would seal up the windings, making them impervious to moisture and preventing all electrical discharges and leakage between its turns and layers. This method of treating spark coils is quite recent, and is by no means as yet universal among the various spark coil builders. If spark coils were all built properly with the proper kind of windings, and the proper kind of vibrators used, and the coils used in connection with the proper kind of timers, that is, timers which do not have an unnecessarily long period of contact, it would be found that the battery consumption could be reduced very materially. Many people seem inclined to blame their batteries for all of their troubles, whereas if the truth were known, the fault, in a great many instances, would be found in the quality of the spark coil that was used and not in the batteries.

Source of Jump Spark Current

As to source of current for jump spark ignition there are two kinds of magnetos which may be employed, also battery ignition can be employed. The dynamo type of magneto with commutator and brushes and governors is no better, so far as the power given to the engine is concerned than are batteries. The inductor type alternating current magneto, the voltage of which increases directly as the engine speed increases, gives a much hotter spark at normal rates of engine speed than either the dynamo type of magneto with governor, which has a fixed voltage, owing to its having a fixed speed controlled by governor, or a battery, which we know has a fixed and non-increasable voltage.

Reason For Increased Voltage

The reason increased voltage is required as the engine increases its speed is because the timer contact points in passing over each other rapidly do not come into as intimate electrical contact with each other, as when the engine is running slowly, consequently the resistance of the timer increases directly in proportion to the speed of the engine, and as the voltage of battery or dynamo type magneto does not increase to meet this increased resistance of the timer, the battery or dynamo type magneto spark, consequently gets weaker as the engine speeds up, on account of this added resistance to the primary circuit. It is, therefore, evident that a source of electrical current, the voltage of which can be increased automatically as the engine increases in speed, is the best source of current for operating a jump spark system of ignition which employs the ordinary timer and vibrating coil.

Manufacturers' Communications

DENIES THE BLOWOUTS

Chicopee Falls, Mass.—Editor Motor Age—On page 20 of the March 11 issue of Motor Age there is an article headed "Knox Wins Match Race." We desire to correct a statement made which says that the Knox car blew off three tires between Buffalo and Fredonia on the way out. Both of these cars were fitted with Fisk tires on Fisk removable rims, and although the roads were in the worst possible condition, the contestants spoke very highly of the performance of the tires. The driver of the Knox car reported three punctures to our Buffalo branch manager, necessitating three tire changes, while the driver of the Packard car made only one change. Both drivers were very enthusiastic over the service which Fisk tires and removable rims gave on this run. —Fisk Rubber Co.

NOT ALLIED WITH STERNBERG

Wichita, Kan.—Editor Motor Age—We noticed in the issue of February 25 an article published concerning the firm here. We are in no way connected with J. L. Sternberg & Co. The style of the firm here is the United Motor Co., owned and operated by M. L. Arnold. This has caused considerable annoyance to us, so we would be glad if Motor Age would deny this in its next issue. We handle only the Mitchell and Auburn cars in this vicinity. —United Motor Co.

MOTOR CAR TIRE LOGIC

Akron, O.—Editor Motor Age—Although in a long run tires become considerably heated, the cause for this is not well known. The heating is the direct result of the frictional action between the outer shoe and the inner tube. It can be in a large degree avoided by rubbing French chalk over the inner tube before it is inserted into the shoe. This reduces the friction between the shoe and the tube to a minimum, and, consequently, diminishes the amount of heat generated and the amount of wear experienced.

Relative to the vast amount of rubber used in the motor car industry, there is no danger of the crude rubber supply being exhausted. Notwithstanding the enormously increased demand for tires and general rubber manufacture, we do not fear, for there are 500,000 acres under successful cultivation in Central and South America. Large areas are ready to produce.—Goodyear Tire and Rubber Co.

AMERICAN GOODS ABROAD

New York—Editor Motor Age—As evidence that American motor products are gaining a strong foothold on the foreign markets the following from the Sporting Times of London is conclusive. It is a well known fact that to the British public, everything of British manufacture is the "best ever." Therefore the article in question has an added value that is highly satisfactory to the American manufacturer of the product mentioned. Brakes and brake linings was the subject and the writer wound up his article in the following manner:

"I have a car with the old-fashioned external brakes. These never have been really satisfactory till just lately, when I lined them with a new stuff called Raybestos. It is composed mainly of asbestos woven with brass wire. Oil will not burn out or carbonize. The braking efficiency is wonderful; I believe I could pull up on a 1-in-4 grade without the use of my foot-brake. The stuff is not cheap, but this is compensated by its wear-resisting qualities. If your brakes are not quite good, just try it. You will not be disappointed." —Royal Equipment Co.

ROAD RACING AND THE LEGAL SPEED LIMIT

By E. P. Chalfant
General Manager A. L. A. M.

THE public must now realize that motor car contests are in their infancy. However, the most expert men in the business cannot tell what turn the sport is going to take next.

The whole manufacturing world is divided on the subject of racing. One maker says the sport is of no benefit to the industry; another says it helps more than anything else. Some favor a speedway, but urge the importance of practical contests.

Racing undoubtedly has a very material function in mechanical progress. It develops the art of driving specifically and executive ability broadly. It has a great human interest, which will not and should not be suppressed. It is undoubtedly the supreme test for one thing, and its excitement and interest have proven of such a nature as to draw the biggest crowds ever seen at any sporting event. The road race naturally stimulates the strongest efforts of the designer, the draughtsman and the manufacturer. To continually improve the result to the limit of skill is to gain for the factory and the industry.

Healthy growth and development can, however, proceed on no other than rational lines. The members of the A. L. A. M. have done much to encourage rational contests and keep them within proper bounds.

Recently in various parts of the country challenges to speed and endurance contests on the public highways have been issued. Wherever such contests involve a violation of the village, town, city or state speed laws, obviously they should not be tolerated. The inhabitants of the territory passed through at an illegal rate of speed, may very reasonably have a feeling of bitter and retributive resentment, which may very possibly record itself in positive legislative action, which will oppress the fair motorist and militate against the interest of the motor car industry as a whole, and impede the normal development of mechanical road traction. Such short-sighted affairs can only tend strongly to precipitate contemplated adverse laws in the form of bills proposed in the various state halls of legislature, or, unhappily, to defeat the passage of what liberal legislation may have received some encouragement. There was an instance of the last mentioned kind in a state nearby recently.

It is impossible to foretell what may be the result of any cross-country road race at speed. It is impossible to run a race in which speed is not used, no matter how the driver may be limited in action. Invariably speed laws will be broken.

Let us consider the worst effect of all. Motorists in this country, assisted by a good many other people, are doing their utmost to get good roads appropriations through state legislatures and congress. The violation of speed laws can only alienate friends in this field and prevent the making of new ones. It should only be necessary to recall to any forgetful mind that good roads are largely the sine qua non of motoring.

If road races must be run, a 20, 30 or 40-mile course should be arranged for by consent and according to law; and be properly protected and policed during the conduct of the race. Doing anything else is worse than unkindness to a dumb animal. The car can easily survive conflict with its legitimate enemies. Nevertheless it should be protected as much as possible from its fool friends. Many of the members of the licensed association have consistently supported sensible contests and will continue to do so.

A reliability contest of not more than a day's duration, over recognized motor car thoroughfares; and conducted by promoters who obligate themselves that speed laws will not be violated—safe-guarding this obligation by proper controls—can result in the fair promotion of the sport, and in properly testing out new models for manufacturers, particularly when such contests are held under difficult road conditions.

Formula Explained

By Howard E. Coffin, A. L. A. M.

The relation of long or short stroke in the actual determination of the horsepower which will be delivered on the brake by an engine has no more influence than have a half dozen other features or variations of engine design.

The development during the past year, abroad, of some motors of a fixed bore but of an abnormal and commercially impracticable stroke, has had a great deal to do with the current discussion of the A. L. A. M. horsepower formula. This formula, $\frac{D^2 \times N}{2.5}$, wherein D is the diameter of the cylinder, N the number of cylinders and 2.5 a constant, adopted as a result of a long series of experiments by the members of the Association of Licensed Automobile Manufacturers, upon motors of various types and conditions, does not, it is true, take cognizance of the length of stroke per se. It is also true that some more or less complicated formula can be developed that will take into account the length of stroke. In fact, there have been so many of these formulæ proposed and discussed upon both sides of the water, that as is usually the case where too many cooks get a spoon in the broth, it would seem impossible to settle upon any formula that could give universal satisfaction. It is very questionable, also, whether any such revised formula would be any more accurate in the end, even though it did take the matter of stroke into account.

Matters of compression, of the design of the combustion space, of the weight of the reciprocating parts, of the size of valves, and of perhaps a half dozen other considerations, might and do go to influence the brake horsepower delivered by a motor, fully as much as, or more than the length of stroke, within the range of successful commercial construction.

About the same discussion upon this same A. L. A. M. formula has been going on for a considerable time past in England, where the formula was originally developed and adopted by the Royal Automobile Club of Great Britain and Ireland. The formula has for its intent a simple, fair and uniform rating of gas engines of the usual type and within the limits of construction which have come to be recognized in the motor car industry as commercially satisfactory. There will always be freaks, both up and down the scale, to which the results obtained from this formula may not be applied. This same condition would hold with any formula that might be invented and, in fact, it becomes very much of a question whether or not greater variations would not be introduced in any formula in which were combined any of the other influences that enter into the actual power delivered by a motor. Even though a manufacturer may guarantee a horsepower from 20 to 30 per cent greater than that indicated by the formula and at a piston speed which is much higher than that contemplated by the formula—namely, 1,000 feet of piston speed per minute—yet the fact remains that this same motor when reduced to the common basis of 1,000 feet of piston speed per minute, will very probably not be so far away from the result given by the formula, as might at first appear.

In any event, it may be pretty generally assumed that any other motor of the same or different diameter of cylinder, when placed upon the same basis of 1,000 feet of piston speed per minute, will bear a power relation to the first motor entirely in accordance with the formula.

This A. L. A. M. horsepower formula is a safe one for the buyer, in that he may always figure it as on the low side of the actual power of a good motor. The fact that speeding up of the motor so that the travel of the pistons over the surface of the cylinder walls will be much greater than 1,000 feet per minute, will enable the manufacturer to produce and guarantee a horsepower greatly in excess of that indicated by the formula, has no bearing whatever upon the very definite and very practicable uses of this formula as a basis of comparison of the performances of gasoline engines.

From the Four Winds

N S E W

Maryland Progressive — The growing popularity and importance of the motor car in Maryland is being attested right along. The latest proof of this has taken place at Rick Hill college, the venerable institution of learning at Ellicott City, Md., where the students have been given as a model in mechanical drawing the chassis of the Oakland car.

Stopping Joy Riding—The Automobile Club of Maryland has adopted a new method in its efforts to prevent joy riding by chauffeurs. The club has decided to have slips printed with the chauffeur's name and number of car and turn a list over to the police department for the purpose of reporting the number of the motor car in case it is seen in any questionable neighborhood at any time.

Beautifying Parks—Motorists at Hamilton, O., are much interested in a proposed plan for an elaborate park and boulevard system, which will be perfected the coming summer. The board of park commissioners recently received from George Kessler, landscape gardener and architect, of Kansas City, the initial plans for the establishment of the system. He will assume personal charge of the work on April 20. Thousands of dollars will be spent on the project.

Shows Road Conditions—A 50-horsepower car with which J. A. Rice, of Baltimore, intended to make a record-breaking run to Boston and return in from 42 to 48 hours, got stuck in a quicksand just beyond Newark, Del., and the trip for the time being had to be abandoned. The car was sent back to Baltimore, but Rice announces he will make another attempt for the record within 2 weeks. The trip was begun last Thursday night at 6 o'clock and at 11 o'clock, the same evening, it became entangled in a quicksand, where it laid for 18 hours, when a team of three horses succeeded in freeing it. This has aroused the citizens of Newark and George G. Kerr, of that place, has gone so far as to take photographs and collect data which he proposes to present to the county commissioners with the request that this bad spot in Delaware's road system be remedied.

Club at Cheyenne—The Cheyenne Motor Club has been formed at Cheyenne, Wyo., and as a starter twenty-five members have been enrolled. The organization has been completed by the election of W. B. Barnett, president; Joseph Stimson, first vice-president; Dr. Snyder, second vice-president; G. F. Horn, secretary and treasurer. A committee on constitution and by-laws, consisting of W. E. Dinneen, L. E. Smith, Percy Hoyt, John Schuneman and F. V. Wright, was also elected. Arrangements will be made soon to secure suitable club rooms, and a campaign to bring the Glidden tour through Cheyenne will at once be started.

Speedway for Utah—A plan is on foot to construct the finest speedway in the world, and if the efforts of the Salt Lake Automobile Club of Salt Lake City, Utah, count for anything Decoration day, May 30, will see cars speeding over the new road at a higher rate of speed than ever before attempted in this part of the country. The speedway, which is to extend from Salt Lake City to Saltair, a distance of about 15 miles, will be constructed of shale rock. It will be entirely free from curves and angles, and when completed will cost approximately $85,000. A few days ago a party of 200 owners, a large number of real estate dealers and contractors and engineers went over the proposed route in a special train—the route lays close to the railroad tracks—and found several unlooked for features that will have to be reckoned with. That they can and will be overcome, however, is the opinion of those interested, and after another meeting or two to formulate definite plans, award contracts, etc., the work will begin, to be completed by May 30.

Little But Enterprising—The little city of Evansville, Wis., will soon have a club, which will affiliate with the Wisconsin State A. A. Twenty-two prominent residents of the little city have purchased cars, and at the suggestion of the Milwaukee Automobile Club are agitating the formation of a local club. If this is done, Evansville will have the honor of being the smallest city in Wisconsin to have a club.

Parade is Planned—One of the principal features of Indianapolis show week, March 22-27, will be a motor car parade, which will be held on the afternoon of the 24th instead of at night, as at first planned. It will start on the Capitol avenue boulevard at Fall creek, at 2 p. m., and will be led by the cars used by the police department, carrying Mayor Bookwalter and other city officials.

Syracuse Club Banquet—The seventh annual banquet of the Syracuse Automobile Club was held in the Yates hotel, Syracuse, N. Y., March 10 with about 200 members and guests present. C. Arthur Benjamin was the toastmaster of the evening and the following responded to toasts: Mayor Alan C. Fobes, Giles H. Stilwell, Dr. W. K. Wickes, Douglas E. Petit, attorney, and Rev. D. B. Thompson, and President Hurlbut W. Smith. The club has a membership this year of 250 and President Smith stated that an effort will be made to reach the 400 mark before the next banquet, when it will be possible to engage a permanent secretary and club rooms.

Brush Run to Capital—An interesting after feature of the Baltimore show was furnished by the four Brush cars used in the exhibit. These four cars, including the mail car destined for postal service, left Baltimore after the show enroute to Washington, each carrying an extra passenger. Under trying weather and road conditions the 80-mile run was completed without a stop of the motor or adjustment of any kind. The roads in places were almost impassable. On one occasion, it is stated, a runabout discovered a 40-horsepower car with the mud over the hubs and unable to proceed. The car was emptied of its five passengers and was only able to proceed with the aid of chains and the assistance of the Brush. The caravan was a source of wonder to many occupying seats in the larger cars.

MOLINES ON GOVERNMENT ISLAND AT MOLINE, ILL.

not one of them being stalled. The mail car carried the materials used at the show and an extra passenger. It made the run without a hitch and pulled into Washington in company with the other members of the caravan.

On the Alert—The Massachusetts State A. A. held a meeting during the Boston show and there were delegates from all the clubs in the state present. In all about seventy-five members were present. President A. E. Bliss presided. There was a discussion of motor laws and the association pledged itself to work to prevent any inimical legislation being passed at the present session of the Massachusetts legislature.

Taxicab Rivalry in Atlanta—Taxicab competition is a new development in Atlanta, Ga. One company, the Atlanta Taxicab Co., has had cars in operation there about 2 weeks. Now comes H. L. Hopkins, president of the Atlantic Motor Co., who has organized a company under the modest title of the National Taxicab Co., which has ordered ten cars as a starter. Whether Atlanta, whose "newspaper population" is but 150,000 and whose real population is doubtless a bit less, can support two lively taxicab companies is a question which is soon to be answered. Where the horse-drawn cabs come in during this fight for patronage can be easily discerned.

Hartford Club Will Expand—At a well-attended meeting of the Automobile Club of Hartford Friday evening many interesting topics were up for discussion, chief of which was the broadening out of the organization and the acquirement of a permanent abode. The matter of a clubhouse has always been a topic of discussion. A committee consisting of General Wallace T. Fenn, chairman; Edgar L. Hopkins, F. W. Stickle, N. F. Allen, C. H. Veeder, C. D. Rice, H. P. Maxim, George W. Merrow, A. G. Hinckley, F. A. Morley and F. W. Dart was appointed to draw up suggestions for the expansion of the club. The committee will report at a banquet to be held on Friday evening, March 26. A regular business meeting will follow the banquet of the Hartford club.

New Directors Chosen—At the annual meeting of the Automobile Club of Philadelphia last week four members of the board of governors were balloted for. Three former members were re-elected and W. O. Griffith was chosen in place of Isaac Starr, resigned. The board, as now constituted, is made up of Powell Evans, S. Boyer Davis, D. Braden Kyle, Henry P. Baily, Jacob J. Seeds, Stedman Bent and W. O. Griffith. After the business had been disposed of and before the supper was served an interesting exhibition of the year's work of the routes, maps and signposts committee was given by its chairman, W. O. Griffith, including advance copies of the new route book, new maps, samples of the signs used in posting roads and other interesting exhibits relating to and explaining the club's work and its purposes. President Powell Evans' report showed a total membership of 708.

PICTURESQUE PART OF GOVERNMENT PARK AT MOLINE, ILL.

Maxwell Test On—At 10 o'clock last Saturday morning the Longstreet Motor Car Co., 205-207 North Broad street, Philadelphia, started one of its Maxwell Junior runabouts on a 2,000-mile non-motor stop run up and down Broad street and around the suburbs of the Quaker city. Three shifts of 8 hours each have been formed and the car is running on a legal speed limit schedule—about 12 miles an hour. Relays of local newspaper men are accompanying the drivers to keep tab on the test.

Packard Road Breakers—The road testing corps of the Packard Motor Car Co., in charge of the chief tester, W. J. Birmingham, was recently given the job of breaking the snow on Grand boulevard, Detroit. The recent heavy snowstorm in the central states covered the streets with a layer of heavy snow almost a foot thick. In order to break this snow evenly and prevent traffic from following a single path and forming deep ruts, the Packard testers were sent out to break the snow evenly. Driving in ruts is disastrous to roads, even when the ruts that are followed are made in the snow and frozen hard. If these tracks in the snow are followed until they are worn into deep trenches and then it thaws the roadway underneath naturally is greatly damaged.

Hill-Climb Scheduled—The Grand Rapids Automobile Club, of Grand Rapids, Mich., has perfected plans for a hill-climbing contest. Suitable prizes will be given and the date will be announced later. The course will be up one of the hills of this city, probably Reservoir hill. The club has not yet decided upon a new clubhouse for this summer but probably will use the old one near Cascade. This building, however, is somewhat out of date and, as several other propositions have been offered to the club, it is barely possible that it will be abandoned.

Maryland Fights Bill—The organization of motorists in the various sections of Maryland for the purpose of making a combined fight against the passage of the proposed Swann motor vehicle bill continues. Secretary Frank W. Darling, of the Automobile Club of Maryland, has just returned from Union Bridge, where he organized an association of motorists of that section for the purpose of taking action in the fight against the proposed new tax rate on motor vehicles in the state. Raymond K. Angel was appointed temporary chairman of the new body.

PACKARDS USED AS ROAD-BREAKERS IN DETROIT

ANALYZING MOTOR CARS' STEERING SYSTEM

EDITOR'S NOTE—This is part 2 of a series of articles by Thomas J. Fay, dealing with the problem of the steering system in motor cars.

STEERING is not necessarily a safe enterprise because speeding on curves is avoided. Speeding on a tangent, in a straight line, has the disadvantage of making it difficult to steer clear of an obstruction if, perchance, the sped is so great that the car cannot be stopped in time, and if room is not afforded sufficient to clear the obstruction.

Applying the brakes will be of no value at all when the speed of a car is so great that it cannot be stopped within the distance afforded. True, a car can be slowed down, and in so doing take advantage of the brakes all possible. When the brakes will no longer serve it is then a question of steering only, and since it will be difficult to avoid a collision under such conditions, the question is, what will be the safest course? There is no actually safe way, since, presupposing a case in which a car connot be stopped, is admitting that an obstruction will be collided with, assuming it is in the way.

It would be easy enough to say, do not go so fast that the car cannot be stopped within the allowable distance. But this is so self-evident as not to require any attention, and the other side of the question has its serious phase. Attempting to turn out after it is found that the speed cannot be checked is dangerous, since if a car turns over it is likely to do more damage to the occupants than the direct result of a collision, if the same is intelligently courted.

Possible Turning Speeds

The chart, Fig. 1, shows under what conditions a car will capsize if the speed is too high, and if the turn is short enough to introduce a sufficient turning moment. The chart shows, for instance, that if a car is turned on a 50-foot radius it will capsize when it is going at 26 miles per hour, in round numbers. In this case it is assumed that the car is well designed, and that the road is level and hard. If the road is slippery, it is then that the car will skid until the wheels take a purchase against some obstruction, and then the car will capsize.

If a turnout which really amounts to speeding on a curve is so fraught with dangers, the question is, what is the best thing to do? If, in an emergency of this kind, the car is steered straight ahead in

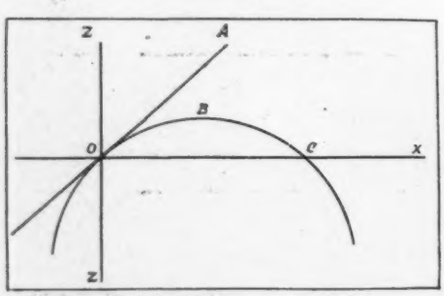


FIG. 2

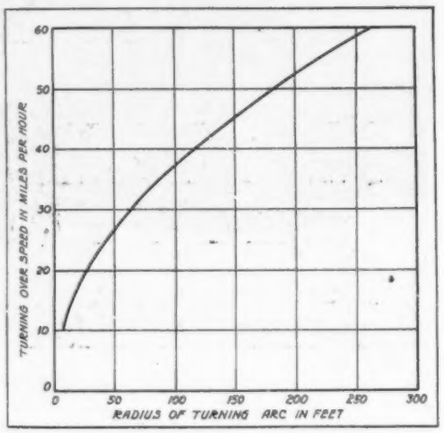


FIG. 1

order to prevent turning over, and if a collision follows, the main point is to so direct the collison as to be sure of a clear space ahead in which to shoot out of the car and travel the greatest possible distance in the air, unobstructed, before landing.

Theory of Projectile

Following the law of the unresisted projectile seems to be the safest course, and, as Fig. 2 shows, the performance will be in obedience to a compound of vertical motion of a falling body, and of the horizontal motion due to the horizontal component of its velocity of projection. In the figure, let O represent the point of projection—the seat of the car—and while it will be impossible to tell the elevation of the path, let the direction OA indicate an upward inclination. In this way it will be feasible to say that the path OA as it relates to OX will be at some angle. Let the angle XOA = ?. The horizontal increment will be equal to

5.....V cos ?

The vertical—downward—increment will be

6.....V sin ?

When

V = velocity of projection, so that, at the instant of projection, the two components will be in the relation as above given.

Gravity influences the situation in accordance with the gravitational laws, just as would be the case were a motorist to fall out of the seat to the ground, the vertical distance from the seat to the ground, and the fall will be no more damaging if the same motorist shoots ahead for whatever the distance may be, complying with the law of unresisted projectiles. The time interval during the projection will be that required for the motorist to fall to the ground direct from the seat. The distance that the motorist would shoot ahead could be worked out, but it would be of small avail. In one amine into closely the distance was 69 yards, in which case the motorist was not hurt, for the reason that he did not strike anything while going through the air more resistant than the air.

In an emergency such as this it would seem as if it is better to select the collision point with a view to accepting the projection, rather than to turn out, and in so doing be sure of turning the car over with good chances of landing under the same. The main reason for thus attacking the subject, however, is to clearly indicate that it is not safe to drive under conditions which will not allow the motorist to see ahead far enough to allow him to judge of the nature of the road if the speed is so high that the brakes will not serve for the purpose of quickly arresting motion, thus making it absolutely a question of steering.

That the future will hold some improvements in this connection is shown by the latest devices abroad, in which air is used to help snub motion, and since the air is in no way connected to the question of adhesion of the tires to the road, it follows that air brakes will put a new face on the situation and possibly shorten the distance in which motion can be arrested. Fig. 3 gives information in relation to the resistance offered by air to the transit of a body, and the chart will apply in two ways to the point to be here made. As the chart shows, if a car is going, say, 60 miles per hour, the wind resistance will be between 13 and 14 pounds per square foot.

Aerial Brakes Possible

If an air propeller will serve to drive an airship, which is a settled fact, the same air propeller will serve to stop a car, and it matters not at all if the car is going through the air or rolling over the ground on wheels. If the car is rolling over the ground it will be possible to snub motion with the idea of reducing speed to a safe point, in view of the road condition (a) by using the brakes up to the limit of the tractive ability, and (b) through the use of the wind brakes, which will work whether the wheels slip or not.

It is this same wind resistance which enables one to be projected out of a car

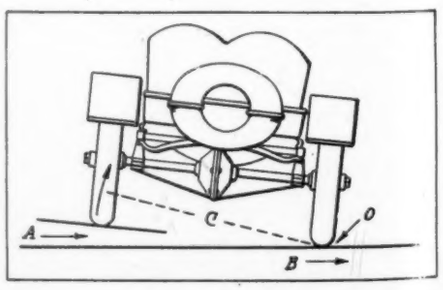


FIG. 6

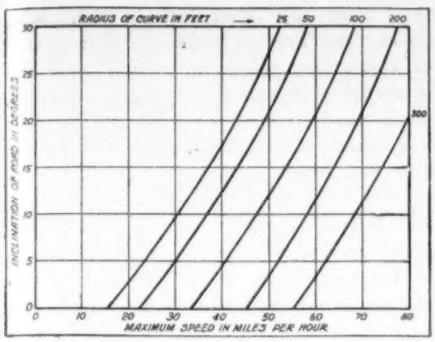


FIG. 4

and land a considerable distance ahead without being seriously hurt. The energy is expended in overcoming wind resistance, and the end is that the fall to the ground from no great height is all to be dreaded. On the other hand, it is of the greatest importance to select an unobstructed orbit, if such it may be called, to avoid impact with some obstruction, since such a contingency will result in quite another story.

Resistance of Air

To show that wind resistance is quite an effective phenomenon to encounter it is only necessary to take into account the result of the pressure at 60 miles per hour as before referred to. If the resistance is fixed at, say, 13 pounds per square foot, and if the front area of a car is 10 feet, the instantaneous value of the horsepower increment will be fixed by the formula,

$$7\ldots \text{H.P.} = \frac{PA\ (M \times 5{,}280 \mid 60)}{33{,}000} = 0.96\ PAM.$$

When,

H.P. = Instantaneous value in horsepower;

P = Pounds per square foot pressure due to wind;

A = Front area of the body in square feet;

M = Speed in miles per hour.

As a practical demonstration of the formula, assuming that the front area of a car may be 10 feet, if the speed is 60 miles per hour, the wind resistance will have the equivalent value as follows:

$$\text{H.P.} = \frac{13 \times 10\ (60 \times 5{,}280 \mid 60)}{33{,}000} = 20.8.$$

Thus far the discussion has taken into account hard, level roads. If roads are banked on curves it is quite another story that may be told, for then the speed can be increased as Fig. 4 will show. As the curves show, if the inclination of the embankment is 20 degrees, and if the curve is at a radius of 300 feet, the speed can be 80 miles per hour, which is a very considerable increase over what can be allowed if the road is level. On a level road it was shown in Fig. 1, part I, of this article that the speed could be but 53 miles per hour with the same radius of curvature, that is, 300 feet.

Another look at Fig. 4 will show that decreasing the radius of the arc of turning has the usual effect even if the road is banked, in that the speed must be lowered, if the radius is shortened. If the radius is, say, 100 feet, then a 20 degree inclination of the embankment will allow of a speed of about 60 miles per hour. Of course these speeds sound high, but by dealing in high figures it becomes possible to accentuate the points to be made.

Unfortunately, road, instead of being embanked, are cambered—with a crown at the center—the amount of the camber differing in the several localities, and under varying conditions. The crown or camber of the road is quite pronounced on many pikes as to become a menace under certain conditions of steering. The general formula of the crown which would serve well for drainage purposes in practice is given as follows:

$$(8)\ldots\ldots O = C\left(\frac{D}{R}\right)^2,$$

When,

O = Ordinates in inches;

C = Crown in inches;

D = Distance in feet from center of the road to the ordinates, in each case;

R = One-half the width of the roadway in feet.

Road Camber Factor

Taking into account the camber of the road and the fact that, in turning, the off side of the road is used, it is plain to be seen that, instead of an embankment, it is a declination that will be used. The effect of this declivity is the reverse to that of an embankment, as the curves, Fig. 5, show. Looking at the curve will show that on a 5 degree slope, downward, the safe speed is reduced to 24 miles per hour, approximately, if the radius of the turn is 100 feet. The same turn can be made at a speed of 32 miles per hour if the road is level, as the curve also indicates, and with an embankment of 5 degrees it is shown in Fig. 5 that a speed of 35 miles per hour will be safe. Obviously, much depends upon the slope of

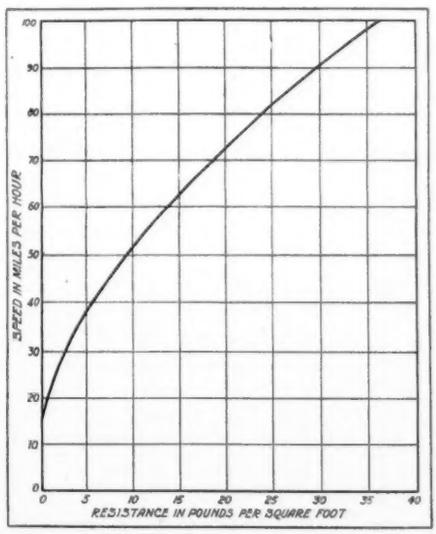


FIG. 3

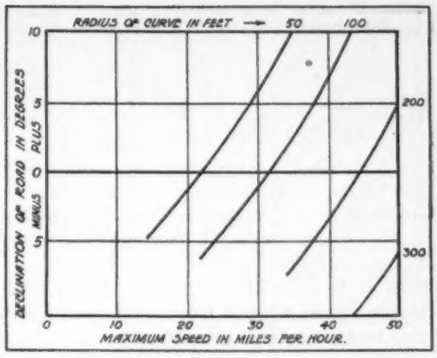


FIG. 5

the roadway at the point of turning, and if the slope is declining, provided the raidus of turning is short, it is anything but safe to make the turn at a very high speed.

Since steering really depends upon the tractive ability of the wheels of a car, it is of interest to note that the traction decreases as speed increases, and on a curve, where the traction is the most needed, the inner wheel leaves the road if the radius of turning is short or if the speed is high. Fig. 6 shows something of what does happen, assuming in this case that the car is being viewed from the rear, and making a turn to the left. The inner wheel will leave the roadway at the point A, turning on the out-wheel as an axis at the point O, to the radius C, rotating in the direction as shown by the arrow. The wheel in contact with the roadway will tend to slide in the direction of the arrow B, and this wheel will have to afford all the tractive force.

The curves for speed on arcs of circles will hold true in all cases in which the radius of turning is not too short, but the performance, as shown in Fig. 6, will defeat all the laws and render the going dangerous, unless it is on banked curves, when the in-wheel will tend to stay on the ground, affording some measure of the tractive ability excepting when the speed is higher than that allowed according to the curve of safe speed under such conditions. As a rule, skidding will intervene before the in-wheel will leave the ground, but a rut in the roadway or an obstruction in the way of skidding will introduce an accident.

Tire Bursting Danger

In fast going, it generally happens that the bursting of tires, as in a blowout, results in danger to the occupants of the car, because the diameter of the wheel is less after the tire bursts, while the tire on the opposite side remains as before. The result is that the car tends to turn in a circle, the axis of which will be a cone, as shown in Fig. 7 at O. If one of the tires is allowed to come off, the cone will touch the rim of the wheel without a tire at A and A′ and the outer wheel, on which the tire will remain, will contact as usual at B and B′. The radius of turning will be

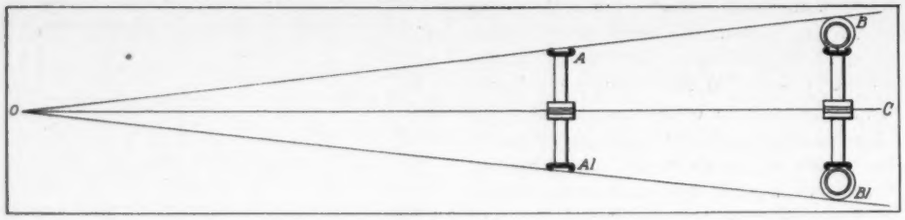


FIG. 7

such as to introduce a serious hazard even if the speed on the car is not very high, unless the driver prevents the car from turning around on the circle whose axis is at O in Fig. 7, since the radius of the curve might be even below 20 feet, depending upon the sizes of tires used on the wheels.

Problem of Tire Pressure

While it is true that the rear wheels should be inflated more than the front, because the load to be borne is more, the fact remains that the front tires should be stoutly inflated in order to assure traction on a maximum basis, on the one hand, and to enable the wheel to cant easily on the other. The pressure per square inch at the point of contact of the tires will depend upon the weight on the wheels and the degree of inflation. If the tires are not well inflated they will squash down and the area will increase accordingly. In this case the pressure per square inch under the tires on the roadbed will be low, whereas if the tires are well inflated it is then that the pressure per square inch will increase accordingly, with the result that the adhesion will be augmented, unless it is that the tires are inflated to a point eliminating any tendency to squash.

The curve, Fig. 8, affords information in relation to the extent to which tires should be inflated considering the best results. In this case air is taken as the medium for the purpose, and it will be worth while to call attention to several details involving the use of other gas media besides air, since the results are not the same in all cases. The curve, Fig. 8, shows that the pressure of the air increases as the tires heat up, as they will under the load, due to molecular work. Some inflating gases are more marked in this phenomenon, and it is important to take this into account.

Air will stay in tires longer than any other gas used for the purpose, for the reason that the defusion of air through rubber is at a lower rate than will be that of carbon dioxide or any other gas such as might be used for the purpose, of which the author has knowledge. In some experiments which the author made for the purpose it was found that the ratio of diffusion of air to carbon dioxide was as 12 is to 30, considering the tubes used in the experiment.

If the inflating is done with carbon dioxide it is necessary to take into account the rate of diffusion, and inflate the tires more often, so that the desired pressure will be in the tires at all times. It is at the time when such matters are not attended to that dangers arrive and hazards make bold to proclaim ownership. It is also true that some gases increase in pressure, due to heat, more than air. This is a matter for separate treatment.

ITALIAN SITUATION REVIEWED

Paris, March 1—French technical writers who have been at the Turin show, the only important one to be held in Italy, have come back rather depressed at the outlook of the ever-progressing Italian motor car industry. Not that they feel any concern for the Italian makers, but they are depressed because the manufacturers beyond the Alps are making such strides and building such fine cars that they fear the Italian makers will soon have a very strong hold upon the French purchasers of high grade cars. Most of the French trade papers in reporting the Turin salon state with frankness and with regret that they fear Italian cars will become every year stronger competitors right in the mother country of motordom. Ever since Fiat won that famous grand prix race and ever since this Turin-made car has defeated the French in every race in which they met the cry of "beware, there's the enemy," has been raised in France against this Fiat and other Italian cars. But there is a reason other than that of the fortunes of the racing game.

Italian cars—a good many of them—are being made with more care for fine finish than most any other cars in the world. So say the French technical critics. One of them, who claims to have visited the principal plants in Europe and America, wrote that nowhere else did he see such well made transmissions, gears, small parts and fine finish in the ensemble of cars than in most of the larger plants in Turin and Milan. Furthermore, he says that a great deal of the Italians' success is due to the enthusiasm of the designers, who put their entire heart in the work and spend days and days and days perfecting one small item or improving something that seems trivial to the average engineer. One of these designers was so enthusiastic, so earnest in his belief and so sound in his argument about the superiority of his car over the French makes that the Frenchman acknowledges he almost became convinced that it was really all as the enthusiastic Italian told him.

It is claimed that Italian labor is much cheaper than labor in France, yet this would not account for the great strides made by the Italians as motor car makers in such a short time. Frenchmen themselves say so and one of their excuses is that the Italians begun to build cars after having waited till the Frenchmen had done all the experimental work. In other words, the critics of France say that the Italians picked up the good things found in the French cars and then studied to improve them.

In general the plants in Italy are better organized and more up to date than those in France. One writer says that he found in a Turin factory the very best of machinery made in the old and in the new world and that in one department of that plant there was more up-to-date manufacturing material than in almost any in France. "Is it thus astonishing to find that Italian cars lack nothing in finish and that parts are finished with a chrometer-like exactness?" concludes one writer.

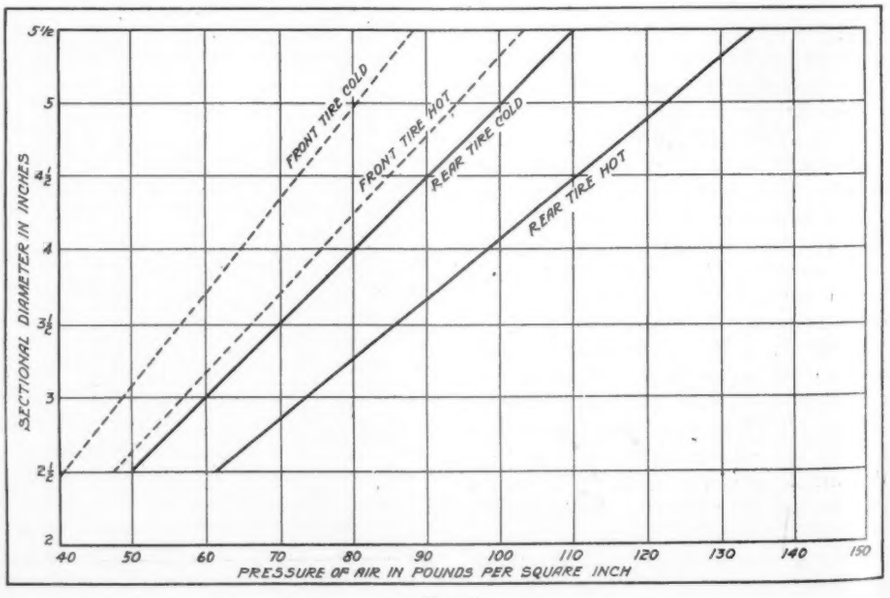


FIG. 8

The Motor Car Repair Shop

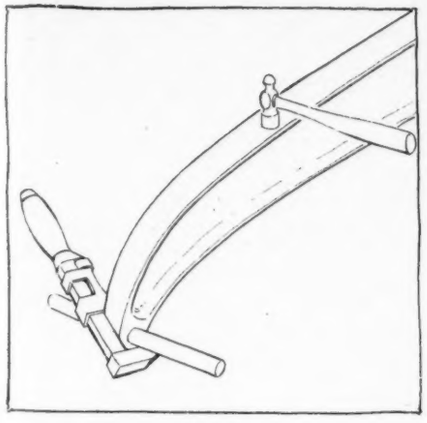


FIG. 1

STRAIGHTENING FRAME MEMBERS

TWO methods of straightening the front ends of side members of frames, preparatory to fitting springs, etc., are as follows: Take a long bolt or rod and pass it through the hole for the shackle bolt so several inches will protrude at either side; then take a large monkey wrench and apply as shown in Fig. 1, put a strain on the wrench, twisting the end of the frame in the desired direction and at the same time tap the frame sharply at the place where it should give. Another method is to heat the frame to a red heat at that place where the straightening process is to take place, then twist to the proper position, tapping the part continually until apparently cold. This insures a more equal distribution of the molecules, a more even grain, and prevents warping in the near future.

REPAIRING A RADIATOR

A quick and effectual method of repairing a honeycomb radiator when the leak is in one or two of the cells, is to take a piece of soft lead, pound it into a round bar about the size of a lead pencil, then with a pocketknife or a scraper, trim it down to a driving fit, and plug the cell at either side of the radiator. Drive the plugs in about a quarter of an inch, then cut off and hammer flush; or if convenient have a tinsmith solder around the edge of the plugs. Unless an expert do not attempt to solder, for one is very apt to open up a few of the surrounding cells.

KEEP BEARINGS ADJUSTED

Running a car with loose wheel bearings not only plays havoc with the bearings themselves, but renders the brakes ineffective, makes a frequent replacement of brake-bands necessary and reduces the power of the car. Every repairman should get the habit of testing wheel-bearings.

ADJUSTING A SET OF BRAKES

Adjusting a set of brakes should in all cases be a very simple operation, but owing to the negligence of some drivers this often becomes a very difficult task. To adjust a set of brakes, first see that the wheel bearings are properly adjusted, then adjust your brake-bands until there is just enough clearance for about two ordinary thicknesses of paper all the way round when the brakes are released. All working parts should be well cleaned and oiled, so perfect freedom of action is assured. Owing to loose wheel bearings, brake-bands are often worn unevenly; in such cases new linings or bands are necessary.

LINING UP ROAD WHEELS

A habit that every repairman should have is that of testing the alignment of the road-wheels of a car before letting it go from the shop. This is a very simple operation and may save the owner of the car hundreds of dollars' worth of tires. A quick method of making this test is to set the front wheel on one side of the car so that when a cord is drawn taut across the surfaces of both wheels at 1, 2, 3 and 4 of the car it will just barely touch both sides of both wheels. Then without moving the wheels bring the cord around to the other side of the car, where if the two wheels on that side are in alignment the cord will touch both sides of both wheels —front and rear—as on the other side. This tests both front and back wheels at the same time. A quick method for testing the front wheels is to measure the shortest distance between the felloes of the wheels and the front springs in front and behind the axle. Set one wheel straight, then without moving the wheels

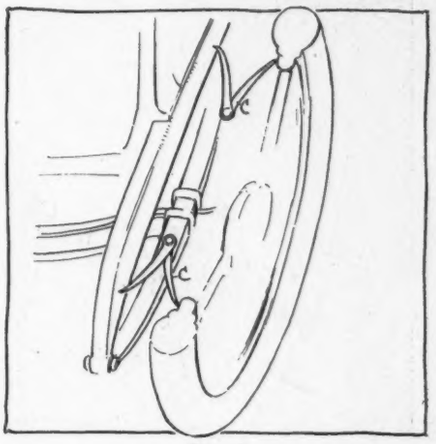


FIG. 2

measure the wheel on the opposite side and see how they compare. A very simple instrument can be made for lining up front wheels, by taking a strip of wood about ½x1 inch and 6½ feet long; cut it in halves, and make a clamp for each half so that when put together you will have a sliding adjustable lap joint R in the center. The distance between the felloes of the wheels is taken in front of the axle, and then in the opposite position behind the axle, and the tie-rod of the car should be adjusted so that both distances fore and aft are equal. Another instrument used for this particular kind of work is an extremely large pair of calipers, resembling the regular outside calipers C generally used by machinists. Its arms are made of wood, and it is used in practically the same manner as the instrument previously described, except that the distance is taken between the outside surfaces of the fellys instead of the inside.

Chain adjustments are often made on cars of side chain drive, without regard to the alignment of the rear axle. This causes considerable unnecessary wear on tires, chains and sprockets. To true up the rear axle equalize the distance between the centers of the jack-shaft and the rear axle on both sides of the car. This can be done by means of trammel-points and a rod, or with a cord that will not stretch, with a couple of nails as center-points.

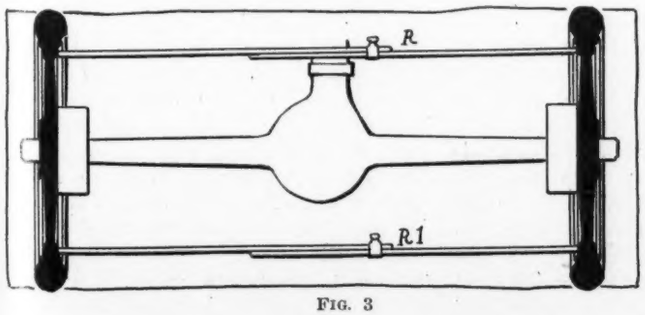


FIG. 3

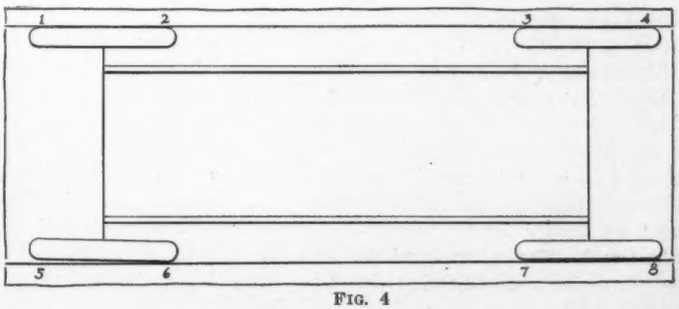


FIG. 4

Among the Makers and Dealers

PLANT OF STEWART & CLARK MFG. CO., OF CHICAGO, SHOWING THE RECENT ADDITION

Root Takes on National—The National line, which has not been represented in Chicago for more than a year, has been taken on by Charles P. Root at 1806 Michigan avenue.

Tire Branch Moves—Business has increased so rapidly of late that Morgan & Wright, of New York, have been compelled to move from their old location at 214 West Forty-seventh street into more commodious quarters. They are now located at 1849 Broadway.

Officers Elected—The Ohio Electric Carriage Co., recently incorporated for the purpose of manufacturing electrics at Toledo, has organized by the election of the following officers: President, A. M. Chesbrough; vice-president, R. R. Lee; secretary-treasurer, J. B. Bell; general manager, H. P. Hodge.

Goodyear Defends Patent—F. A. Seiberling, president of the Goodyear Tire and Rubber Co., of Akron, O., has brought suit against the Standard Universal Rim Co., of Columbus, O., in the United States circuit court, eastern division of the southern district of Ohio, for infringement of patents covering the Goodyear quick-detachable rim.

Huge Motor Built—The Milwaukee Auto Engine and Supply Co., 706-708 Winnebago street, Milwaukee, Wis., has completed a huge six-cylinder motor which will be installed in a specially-built touring car in which Charles B. Manville, of Milwaukee, and his family intend to start a tour of the world. The motor developed 90 horsepower under test and weighs 1,000 pounds. The car will weigh nearly 6,000 pounds complete. It will be entirely Milwaukee-built. The motor was exhibited by the Auto Engine and Supply Co. at the Milwaukee show, March 10 to 13.

Fourteenth Warner Branch—The Warner Instrument Co. has just opened its fourteenth branch office at 914 East Pike street, Seattle, Wash., in charge of H. L. Worthen, recently connected with the Los Angeles branch.

Headquarters Moved—On March 15 the official headquarters of the Motor and Accessory Manufacturers, now located in the Union building, Newark, N. J., will be removed to the Argus building, 17 West Forty-second street, New York city, where the regular business of the association will be conducted.

After Truck Plant—If the people of Ann Arbor, Mich., can raise $225,000 the big plant of the Triple Motor Truck Co. will be located in that city. Efforts are already under way toward securing subscriptions for the amount. The company is capitalized at $340,000 and F. O. Paige, of Detroit; H. A. Wilcox and Andrew Bachle, of Owosso, are interested.

After Overland Plant—The cities of Muncie, Ind., and Marion, O., are offering flattering inducements to have the Overland Automobile Co. locate its plant in those cities, while Indianapolis also will offer inducements to have the plant remain in that city. Recently the company adopted plans for a large factory, to replace the four smaller ones now in use in Indianapolis, but a site has not been selected. When the company was reorganized about 2 years it employed approximately fifty men, while there are now about 1,000 people on the pay roll.

Ball Player Interested—Honus Wagner, the ball player, has just entered into an agreement with the Regal Motor Car Co., of Detroit, whereby he is selling Regal cars this season.

In Good Location—The Reo agency at Oshkosh, Wis., conducted by B. J. Hummell, of Milwaukee, now occupies the New Revere hotel annex at 16 Main street, one of the best locations in the metropolis of north central Wisconsin.

Opens Cleveland Office—The Cutler-Hammer Mfg. Co., of Milwaukee, maker of electric controlling devices, announces the opening of a district office in the Schofield building, Cleveland, O. The new office will be in charge of C. J. Kruse.

Chicago Trade Changes—The tendency on the part of Chicago dealers to extend the row to the south has become even more pronounced and last week it was announced that two more of the agencies would move from their present location in the heart of the row to the southern part of the line, where already the Stearns and Packard have secured sites. H. Paulman & Co., Chicago representatives of the Pierce-Arrow, now at 1430 Michigan avenue, have secured a lot 50 by 187 feet at 2420 Michigan avenue, where will be erected a two-story building which will be ready for occupancy by June 15. The Locomobile branch, now at Michigan avenue and Fourteenth street, has leased

property 75 by 171 feet at the southwest corner of Michigan and Twentieth street and will build a three-story building of re-inforced concrete and steel.

Located at Bangor, Wis.—Elsen & Kneen, of Bangor, Wis., have been appointed district agents for the Reo by the Curtis Automobile Co., of Milwaukee, state agent. The firm has opened a garage in the Koehler building at Bangor.

Opening at Sidney—Sidney, O., has a new concern, incorporated under the laws of Ohio this week with a capital stock of $10,000 and to be known as the Sidney Motor Co. The incorporators are: Emery N. Stewart, George W. Henne, N. W. Thompson, Charles A. Jones and W. J. Emmons.

Adds to Speedometer Plant—The Stewart & Clark Mfg. Co., of Chicago, maker of Stewart speedometers, has just taken possession of the addition to its old plant which was completed 6 weeks ago and which is half as large again as the original plant. New tools and machinery have been installed and the addition is devoted solely to the manufacture of the three new models which the company is bringing out.

New Plant for O.-T.—The Owen-Thomas Motor Car Co., of Janesville, Wis., maker of the O-T Six, will break ground this week for a new factory building at Janesville. A 5-acre tract has been purchased, the object being to provide for expansion. The new factory will be one-story high, of solid concrete construction. The company's lease on the former railway car shops, which it now uses as a factory, expires in 3 months, and it is expected that by that time the factory will be ready for occupancy.

Philadelphia Changes—The Philadelphia agency for the Oakland, formerly loooked after by the Bergdoll Motor Car Co., has been transferred to the Oxford Automobile Co., 238 North Broad street, which also handles the Brush cars in the Quaker City. Another Philadelphia change recorded is the abandonment by the Thomas M. Twining Co., 326 North Broad street, of the local Crawford agency. The Twining concern will hereafter devote its energies to exploiting the Regal in and about the Quaker City.

Cleveland Changes—The Avenue Motor Car Co., 1806 Euclid avenue, agent for the Oakland car in Cleveland, O., has made its appearance on the row there, while the Inter-State is to be sold by the Weddel house garage in company with the Regal. Stahl, Hoffman & Co., Locomobile agents, expect to locate on Euclid avenue shortly, while the new Firestone branch, also on the avenue, is almost ready for its opening. The majority of Cleveland's retail salesrooms are not overly pretentious in structure, but they are attractive, tasty and are pretty well bunched between East Ninth and East Twenty-second streets on Euclid avenue. The Pennsylvania Rubber and Supply Co. has moved to 1843-45 Euclid avenue, while the D. E. Foote Rubber Co. has moved from Frankfort street to 1837 Euclid.

Gives Up Studebaker Work—E. Le Roy Pelletier announces that because of the condition of his health he has given up handling the Studebaker advertising and publicity. In the future he will give all his attention to the E-M-F.

A. M. C. M. A. Moves—The American Motor Car Manufacturers' Association has moved to new and more commodious headquarters on the fifteenth floor of 505 Fifth avenue, New York, which is half a block from the present headquarters on Forty-second street.

Marmon Branch to Open—After having sold cars from its factory for some months, the Nordyke & Marmon Co. has arranged for an uptown sales room in Indianapolis. It will be located in the Central Union Telephone building, at Ohio and Meridian streets, with C. E. Gambill as manager. A downtown garage near the new sales room for the convenience of Marmon owners will also be established.

New Kopmeier Garage—The Kopmeier Motor Car Co., agent for the American in Milwaukee, is building a $30,000 garage on Lafayette and Summit streets, to be completed about the first of April. The new building has a frontage of 120 feet and is 150 feet deep. The capacity will be approximately 130 cars. A 6-inch cement floor will be one of the features. The roof is made of concrete over steel girders.

Witherbee Moves—The Witherbee Igniter Co. has moved to Springfield, Mass., where it has secured a factory at Birnie avenue and Arch street. It is a modern brick building four stories high and with approximately 35,000 square feet of floor space. The general offices of the company have been established in the new plant. The motor mart quarters in New York city will be used as a branch where the company will continue to manufacture and repair Witherbee batteries. At the Springfield plant will be made Wico commutators, spark plugs, ignition wire, batteries and Volta magnetos.

Service for Ohio—A passenger motor service will be established between Camp Perry and Port Clinton, O., this summer by Henry Reimers. All the preliminary details have been arranged and it is thought that because of the numerous entertainments billed for these grounds the undertaking can scarcely fail.

Gibneys Will Move—James L. Gibney & Brother, now at 211 North Broad street, Philadelphia, have just taken a long-term lease on the properties at 215-217 North Broad street, which, after extensive and interior alterations, they will occupy as a supply house. The Gibneys handle Continental tires in the Quaker City. They move about April 1.

Chicago Dealers' Ticket—The nominating committee of the Chicago Automobile Trade Association, through its chairman, E. Q. Cordner, has named the following ticket for the annual election a week from Friday: For president, N. H. Van Sicklen, Sr.; for vice-president, H. C. Tillotson; for treasurer, Henry Paulman; for secretary, F. E. Sparks; for directors, Thomas J. Hay, E. Q. Cordner and Walter L. Githens. A members' ticket has Thomas J. Hay for president, Joseph F. Gunther vice-president, H. W. Cooper secretary, H. Paulman treasurer and H. P. Branstetter, A. J. Banta and N. H. Van Sicklen directors.

Japan Up to Date—A motor car transportation company was recently established at Tokyo, Japan, for the purpose of hauling all kinds of merchandise in and about the Japanese capital. The rates per ton for hauling common goods varies from $2.50 for 1 mile to $11 for 5 miles, and for valuable goods from $5 for 1 mile to $25 for 5 miles. In rainy weather an extra change of 20 per cent is made. Motor cars with a driver and a porter may be rented for an 11-hour day for $12, half a day for $6.50, and one hour for $1.50.

SHIPMENT OF TWENTY CADILLACS RECENTLY RECEIVED IN LONDON

Brief Business Announcements

Montclair, N. J.—The Schacht is being handled by W. L. Mason.

Morristown, N. J.—Willard B. Smith, of Chatham, has been appointed agent in this city for the E-M-F.

Dover, Del.—The International Motor Truck Co. has been incorporated with a capital stock of $500,000.

Jefferson City, Mo.—The King Electric Auto and Battery Co. has been incorporated with a capital stock of $5,000.

New York—Mrs. Jessie Williamson Carr, of the Hotel Savoy, has acquired an interest in the American Taximeter Cab Co.

Boston, Mass.—The South End Motor Car Co., of this city, has been incorporated with a capital stock of $30,000.

Trenton, N. J.—The Adams Electric Co. has opened a new garage in the rear of 257 East State street, with entrance from East Front and East State streets.

Newark, N. J.—Percy H. Johnston is about to give up his establishment on Halsey street, and will consolidate that establishment with the garage on Hill street.

Oakland, Cal.—The Consolidated Motor Car Co. has established a branch here at Telegraph avenue and Twenty-second street, to be under the management of Tracy Holmes.

Philadelphia, Pa.—The Gawthrop & Wister Co., agent for the Elmore, has leased a garage at 223-225 North Sixteenth street, and will continue its sales offices at the old quarters at 224 North Broad street.

Kansas City, Mo.—The Automobile Mechanics' Association has been organized, and will open headquarters at 1529 Grand avenue. Henry Fallett is the president, Oscar Bolles, secretary and Norman Wilson, treasurer.

Detroit, Mich.—B. L. Graves, who has been connected with the Ford Motor Co. in Cleveland for the past 3 years, has resigned his connection with the company, and in the future will act as manager of the local branch of the Ford Motor Co.

Des Moines, Ia.—C. B. Copeland, formerly of Sioux City, has been appointed manager of the local branch of the Buck Auto Co., to succeed F. B. Loomis. The Buck company has the agency in this city for the Packard, Studebaker, Matheson, Marmon and Meyer cars.

Pittsburg, Pa.—The Pittsburg Taxicab Co., which is in process of organization for the purpose of running a taxicab service in this city, has elected the following officers: President, John W. Wiley; vice-president, Grant McCargo; treasurer, C. A. Blanchard; secretary, W. S. Lynn. Twenty-five cars have already been ordered and are expected to be in operation very soon.

Cleveland, O.—The Zenith Motor Goods Co. has removed to new quarters at 1841 Euclid avenue.

New York—William B. Hurlburt is shortly to take charge of the New York branch of the Thomas.

Kansas City, Mo.—The Jackson Motor Car Co. has opened a new establishment at 1714 Grand avenue.

Schenectady, N. Y.—Vrooman Brothers, the local agents for the Elmore, have leased a building on Cedar street, Amsterdam, and will occupy it as a garage as soon as the necessary alterations are completed.

Muncie, Ind.—The Warner Gear Co., which is engaged in the manufacture of parts, has just completed the erection of an addition to its factory, and the business is increasing so rapidly that it is obliged to hasten the erection of a new building.

Indianapolis, Ind.—The R. J. Irwin Mfg. Co., which was incorporated last month, was incorporated with a capital stock of $53,000, all of which has bene paid in; not, as was previously announced, only $20,000. The company is to manufacture motor car and motor boat tops and glass fronts. The incorporators are R. J., J. M. and Mathilda S. Irwin.

New York—Monarch Motor Co., capital stock $25,000, to manufacture, rent and operate for hire motor vehicles of all kinds; incorporators, A. C. Rader, E. H. Fritchmann, and F. J. Griffin.

New York—Allenhurst Garage Co., capital stock $5,000, to operate garage; incorporators, D. W. Barrymore, A. E. Balme, J. C. Oldmixon.

New York—R. & C. Co., capital stock $3,000, to deal in power vehicles of all kinds; incorporators, W. H. Raudel, Henry Coplan and F. H. Van Houten.

Columbus, O.—Marathon Motor Car Co.; incorporators, W. H. Carpenter, F. Crosby, Jr., and C. B. Garvey.

Massilon, O.—W. S. Reed Co., capital stock $10,000, to manufacture motor cars; incorporators, W. S. Reed, F. O. Shoemaker, H. McYost, M. Schworm and Mrs. Melville Schworm.

Cleveland, O.—Barger Automobile Co., capital stock $20,000. H. Barger is named as one of the incorporators.

New York—Acme Electric Garage, capital stock $5,000, to manufacture, store and deal in motor cars; incorporators, A. G. Illch, H. H. Illch and H. C. Illch.

Mt. Jackson, Va.—Standard Garage Co., Inc., capital stock of $500 to $5,000, to do a general motor car business. E. M. Hickman is the president; J. L. Wissler, Jr., secretary and treasurer; both being of Mt. Jackson.

San Antonio, Tex.—Semly-Wood-Brownlee Automobile Co., capital stock $15,000; incorporators, F. H. Semly, J. R. Wood and J. A. Brownlee.

Chicago—Universal Rim Co., capital stock $100,000, to manufacture rims and wheels; incorporators, C. G. Hawley, E. K. Baker and R. E. Aiken.

Cleveland, O.—The Cameron Auto Co., of 1038 Prospect street, has been appointed agent in this city for the Cameron.

Brooklyn, N. Y.—The Bruns Automobile Co., agent for the Chalmers-Detroit, is preparing to remove to its new salesroom at 1295 Bedford avenue, corner of Atlantic avenue.

Los Angeles, Cal.—The Woolwine Motor Car Co., agent in this city for the Marmon car and the Rapid truck, is now installed in its new quarters at 1142-1144 South Olive street.

San Antonio, Tex.—In addition to a branch in this city, the Houston Motor Car Co. has also established an agency at Austin. The company will handle the Pierce-Arrow and Oldsmobile.

Pittsburg, Pa.—The United States Steel Corporation has acquired the patent of E. H. Belden, and will at once commence the erection of a plant at Coraopolis. The new concern is to be known as the Belden Motor Co.

Pittsburg, Pa.—A. X. Phalan, of this city, and R. L. Flynn, formerly of the Mitchell agency in Washington, D. C., have formed a new company, to be known as the Pittsburg-Mitchell Co., and will represent the Mitchell in this city.

Kansas City, Mo.—H. Holzhauer, formerly connected with the sales department of the Pope-Hartford Co., has been appointed manager of the local agency of the Pope-Hartford. The concern has established headquarters at 1927 Grand avenue.

Detroit, Mich.—Frederick O. Paige, who was formerly president and general manager of the Reliance Motor Truck Co., of Owosso, is now engaged in the formation of a new concern to be engaged in the manufacture of motor trucks. H. A. Wilcox and Andrew Bachle are also interested in the company.

Lansing, Mich.—Articles of incorporation have been filed by the Hudson Motor Car Co., of Detroit, which has a capital stock of $40,000. J. L. Hudson is to be the president of the company, which for the present will be located in the old plant of the Northern Motor Co., at Champlain street and Canton avenue.

Kansas City, Mo.—The Holcker-Elberg Co. has removed to its new building at Sixteenth and McGee streets. This concern manufactures tops, bodies and windshields, and is also the local agent for the Goodyear tire. The Dempster Machine Co. has been appointed agent for the Locomobile, and will open a salesroom at 306 McGee street.